THE AMERICAN ARCHITECT AND BUILDING NEWS.

VOL. XX. Copyright, 1886, TICKNOR & COMPANY, Boston, Mass. NO. 563.

OCTOBER 9, 1886.

Entered at the Post-Office at Boston as second-class matter.

CONTENTS.

SUMMARY: —
Code of Rules adopted by Boston Master-Builders for 1887.— Pay by the Hour — Protection promised to their Workmen. — Who will have the Sympathy of the Public in Case of Strikes? — The Coming Dedication of the Statue of Liberty. — The Consumption of Alcohol. — The New York Arcade Railway and the Broadway Property-holders. — Paper Rails. 165
ANCIENT AND MODERN LIGHT-HOUSES.— IV. 167
ART IN ALSACE AND LORRAINE.— II. 168
THE ILLUSTRATIONS: —
The Cyrus W. Field Building, New York, N. Y. — The Theological Seminary, New York, N. Y. — Work of the Students in the Class in Decoration at the Museum of Fine Arts, Boston, Mass. — Smeaton's Light-house. 170
A SCULPTOR'S STORY. 170
ON WORKS OF ART FROM THE POINT OF VIEW OF OTHERS THAN ARTISTS. 171
CODE ADOPTED BY BOSTON MASTER-BUILDERS. 172
THE CATHEDRAL OF SIENA. 173
THE FOUNDATIONS OF VENICE. 174
COMMUNICATIONS: —
The Mixing-Chamber for Hot-air Heating. — Intermittent *vs.* Persistent Discharge for Subsurface Irrigation. — German Middle-class Houses. 175
NOTES AND CLIPPINGS. 175
TRADE SURVEYS. 176

NOT long ago the Boston Master-Builders' Association, in the hope of providing for the coming season against such a strike as that which nearly ruined them and their workmen last summer, held a meeting, to which all the principal architects of the city were invited, together with owners of real-estate, to consider methods of resisting the tyranny which the unions exercise over them and their men. As a result of this meeting, the Association adopted and published certain rules, which we print in full in another place, and commend to the attention of architects and builders everywhere. The first of the new rules, which directs that for the season of 1887 all workmen in the building trades shall be paid by the hour, at a price to be agreed on with each workman individually, and shall be at liberty to work nine hours a day, or longer, with extra payment for extra work, is professedly intended to test the question whether ten hours' work is more than the average man, not overawed by the unions, is really willing to do in a day, if he can get paid for it. If the liberty given to the men of choosing whether they will work ten hours or nine results in showing that the greater part of them really prefer to work the shorter time, and give up the money that they could earn by another hour's exertion, in order that they may have more time to improve their minds, the contractors promise to be satisfied with the day of nine hours, and even to consider the question of reducing it still further, if that should be thought desirable. If the contractors are permitted by the unions to carry out this plan peaceably, which does not appear to us very likely, it is quite improbable that there will be any occasion to try the effect upon the minds of the workingmen of shortening the day to eight hours. We need hardly say that if free from the constraint of the union rules, we doubt if any workingman of ordinary ambition or intelligence, whatever may be his ardor for that culture which, according to the labor-reformers, he longs so passionately to possess, would dream of giving up a quarter of the income which he might earn, for the sake of having, after deducting the time necessary for eating and sleeping, seven or eight hours a day of elegant leisure. That the other argument of the labor reformers in favor of short working hours, that by diminishing the amount of work done in a given time they increase the demand for men, and enable those to get employment who would otherwise find none, would have any weight with persons as clear-headed as the better class of New England mechanics, if they were not under undue influence, is still less probable than that they would feel an overpowering need of spending eight hours a day in studying the Divina Commedia, or the Transformation of Coördinates. No amount of sentimentalism can disguise the fact that an attempt by the unions to reduce the working day to eight hours for the sake of increasing the number of men to be employed is simply organized robbery of the men who are willing to work ten hours a day, and are skilful and sober enough to find employment, for the benefit of the idlers whom no master would be willing to hire if he could get his work all done by better men. It may be that the drunken, the vicious and the dishonest workmen need charity, and their families, at least, are likely to have some claims upon the humanity of their fellows, but no one has ever yet reproached American mechanics with being indifferent or niggardly toward those who require their help, and they can, undoubtedly, be trusted to bestow their kindness upon the proper recipients, without having the unions intervene to deprive them forcibly of a part of their income, to give it to those who probably deserve it least; but it is very unlikely that the leaders of the labor organizations in Boston will abandon willingly the claim which serves most effectually to attach to them their most servile and unscrupulous followers, and a struggle over the matter is probably inevitable, either between the masters and the unions, or between the tyrants of the unions and their more independent subjects.

THE Master-Builders' Association promises to protect men who wish to work, in case a strike should be ordered in their trade, and to give them employment so long as there is anything for them to do, and promises also to discharge at once those who attempt to frighten their fellow workmen into joining trade societies, and to prosecute conspiracies to the extent of the law. We trust that this promise will be carried out to the letter. Powerful as are the labor unions, there is no doubt that thousands of their best members are held in them simply by the fear, which is only too well founded, that by leaving them, or showing any insubordination, they would not only cut themselves off from employment, but would expose themselves and their families to bodily injury. If the masters really wish to make their men independent, and to guard themselves and their business in future against the arrogant interference of walking delegates, they must make up their minds to exert themselves. The promise of protection against the vengeance of a labor union is one thing, but the reality is something much more difficult, and if protection is to be undertaken at all, it must be thorough. We hope that there may be no occasion, during the year of experiment, for the Boston builders to assume the defence of non-union men, but if they wish to see, under their protection, the defections from the unions increase, and the ranks of independent workmen reinforced, they must watch over every hair of the head of the first bold men who dare to defy the trade organizations. They may be certain that the wives, at least, of most of the men never forget the terrible history of the great strikes; that they picture to themselves constantly the brutal and cowardly assaults, the wounds, and the violent deaths, which have followed revolt against the unions, and the sight of one bruised and bleeding "scab" will do more in a day to strengthen the labor organizations than all the promises of the masters can undo in a year, and nothing but the anticipation of speedy and easy success will tempt the prudent men to try to break the bonds which now hold them so firmly.

WHAT the master-builders, if they will really try to encourage and defend liberty of individual action among their men, will have the sympathy and encouragement of the community, is evident, as well from what has already occurred as from the voluntary expressions of the persons invited to the Boston meeting who assured them, as we are told, that the insertion of a clause in all building contracts, relieving the contractor of all claims for forfeiture or demurrage on account of delays through strikes, "would be cheerfully granted." We believe that this is true, and that most people would willingly submit to the inconvenience of binding themselves, according to the form now common in England, not to demand damages for delay, "in case of combination of workmen, or strikes, or lock-out affecting any of the building trades," for the sake of helping in a struggle against tyranny; but if the public is to put in the hands of the builders this powerful weapon, which enables them to defy all attempts of the unions to dictate terms to

them, it will expect them, in return, to act promptly in endeavoring to avert or settle as speedily as possible all labor quarrels.

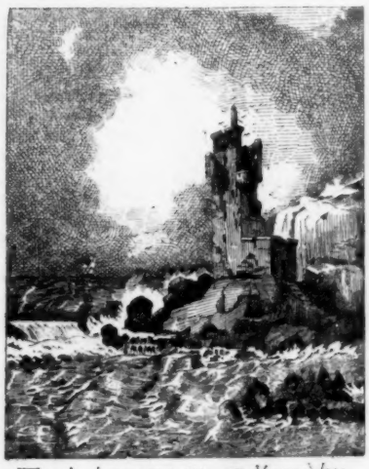
THE fixing of the day for the dedication of the great statue of Liberty ends the long period of uncertainty and anxiety which has elapsed since the first announcement of the gift from the people of France to the people of the United States. On the twenty-eighth of October, if nothing should prevent, the figure will be unveiled in the presence of representatives of both countries. Just what the ceremonies of unveiling will consist of no one seems to know, but we may assume that there will be speeches in English and French, both, probably very good of their kind, the French being quite equal to the Americans in the art of saying agreeable things at great length about nothing in particular. In this case, indeed, there will be more to say than usual. Perhaps the history of the battle of Yorktown and the services of M. de Lafayette is sufficiently well known in New York to need no very elaborate repetition, but there is a great deal in the present relation of France and the United States, and still more in the generous appreciation of nearly everything American which it is now fashionable to show in France, which all Americans would be pleased and proud to hear of, and we are sure that if some American who is familiar with the subject would take the trouble to describe to his fellow-countrymen the great works of peace which the French have accomplished since M. Bartholdi made his first model of the great statue, the remodelling of the school-system, the reconcilement of employers and employed, the improvement of agriculture and manufactures, and the restoration of the public finances, he would elicit, in return, an expression of admiration and respect, which would please the representatives of France as much as their appreciation of our good qualities gratifies us. Such opportunities for the increase of international courtesy and regard as the dedication ceremonies will offer are rare, and we trust that the occasion will be made the most of. On this side of the wide Atlantic we are too much disposed to forget that the whole world looks to the three great free nations, France, England, and the United States of America, to show what can be done by people acting for and governing themselves. We have been so long accustomed to laugh at the doleful predictions which have, for a century, been made about our own future that we care little for the troubles which beset the path of our two rivals, and even, perhaps, enjoy the anxiety which they occasion among those who have to deal with them; yet their difficulties, sooner or later, become ours also, and we can do nothing more effectual for our own advance in the long road which leads to universal liberty and happiness than to cultivate close relations with the two nations which, of all the great ones, care most and do most for the same objects as those which we ourselves hold dearest.

WE are sorry to say that the statistics in regard to the consumption of alcoholic liquors, which are put forth, no doubt, with the best intentions in temperance oratory, occasionally bear the mark of having been at least insufficiently criticised, if not invented on the spot, and it is something of a satisfaction to find, as we frequently do in French journals, figures given without any attempt to produce an effect, moral or otherwise, upon the reader. According to some of these, the greatest consumers of strong liquors in the world are the Danes, who drink, on an average, nearly twelve quarts of absolute alcohol per head every year. Next to them come the inhabitants of North Germany, who annually imbibe nearly nine and one-half quarts apiece; and the Russians follow, with something more than seven and one-half quarts. Austria and Baden are a little more temperate than Russia; and Belgium is considerably more so than these; while the Dutch, who have the reputation of being inordinately fond of "*wijnen en sterke dranken*," really consume, on an average, no more than the French, and little more than half as much as the North Germans. The Swedes are somewhat less bibulous than the Dutch, and the Norwegians are more temperate still, while the people of Bavaria and Wurtemburg, the chosen country of beer, consume less than four quarts of alcohol per annum; their brethren of North Germany thus surpassing them in thirst for stimulants nearly in the proportion of three to one. Notwithstanding the opinion of Cardinal Newman, that intemperance is the national vice of England, the English absorb annually only three quarts of alcohol per head, which is about one-fourth the Danish allowance, and less than one-third that of North Germany. The United States is nine per cent more temperate than England, and Italy is the most given to cold water of all civilized nations, the yearly consumption of alcohol being but one quart per head.

THE New York Arcade Railroad, according to the *Mail and Express*, is "beginning to show its teeth," not, it would seem, without some reason. For an indefinite period a certain number of owners of property on Broadway have been opposing the railroad in the courts, averring that the annual loss of rentals, if the road is built, will be six and one-half million dollars, the loss to the city in taxes one million dollars, while the value of the property "totally lost and destroyed" during the progress of the work will be thirty-seven million dollars. Just how these estimates are made up has never been quite clear, and the promoters of the road, probably finding, as most people do, that an imaginary enemy is harder to fight with than a real one, have just filed a petition to have the complaint of their opponents amended by striking out some of the vague assertions, such, for instance, as the allegation that "business will be destroyed on the line of the railroad," and by giving definite particulars as to the vaults which will be interfered with by the tunnel, the kind and degree of damage, if any, which will be occasioned to particular parties, and the nature of the "many other losses, inconveniences and damages" which are expected to fall upon various persons whose names are not given. The counsel for the opponents of the railway, according to the account, are "confident of defeating the motion," which they regard as a move "to free the bill for its incorporation of all incumbrances," and if they succeed in doing so, as there is no limit to the manufacture of statistics of the kind they presented, the construction of the road may be put off until the next century. On its face, the demand of the Arcade Company does not, to the impartial observer, appear unreasonable. The fact is that the account presented by the Broadway property-owners of the host of damages and dangers which would attend the building of the railway has always borne a considerable resemblance to the panic-stricken tale of the boy celebrated in history, who rushed into the house and told his papa that he had just seen a thousand cats on the front piazza. We all remember that when his parent asked for a bill of particulars of the animals, it turned out that the family kitten and another one were all that could be positively distinguished, and if the Arcade managers can succeed by similar questioning in reducing in the same proportion the thirty-seven million dollars of damages which they are accused of desiring to bring upon the property-owners, the public will not be sorry, in the interest of truth, to see the process applied.

ACCORDING to the *Revue Industrielle*, the American invention of paper wheels for railway cars seems likely to be eclipsed by the Russian invention of paper rails, which have been put into actual use, and have been found to be as durable as those of steel, at one-third the cost. Not only in expense of manufacture, but in cost of transportation and laying, the paper rails are far more economical than metal ones, and, as they can be made longer, and laid with fewer joints, they subject the cars and locomotives which run over them to less wear. It would seem that a rail of such a material must be inevitably crushed by the weight of an engine, or torn to pieces by the rolling of a train over it, but it is found by experiment that the tensile strength of a bar made of slips of paper simply glued together, without compressing, is about four-fifths of that of an iron bar of the same size, and there is less difference than one would suppose between the resistance of paper to crushing and that of iron. It is found, however, that there is much more adhesion between paper rails and engine wheels than when both are made of metal, so that it is not necessary to load the engine to prevent the driving wheels from slipping, and the wear which comes upon the rails is only that of the rolling of the wheels, which is comparatively slight. Whether the compressed paper would resist deterioration from other causes remains to be seen. In the paper wheels the fibrous portion is pretty well protected from the influence of the weather, but rails could not be protected, and the reduction of a portion of a track, by a local inundation, to its original pulp, would be a serious matter for the passengers in the next train that attempted to pass over it.

ANCIENT AND MODERN LIGHT-HOUSES.[1] — IV.



THE WATCH-TOWER OF KOAT-VEN

REVUE DES ARTS DECORATIFS

AS soon as the light-house was destroyed, the proprietors set themselves to work to find some one to rebuild it; fortunately their choice fell on John Smeaton, formerly a philosophical instrument maker, but later a mechanical engineer, and Fellow of the Royal Society, and it is to him we owe *the* famous Eddystone Light-House. He went to work methodically, and examined with great care the work of his predecessors, rejecting the weak and retaining the strong points; he then argued the matter out logically. In the first place he concluded that the weight should be as great as possible, and the mass as small, and that the structure must be safe from fire; these conditions he filled by choosing stone as the material from which to build it, and by so shaping the tower as to give it a broad base and slender waist — as he called it — he states that this form was suggested to him from contemplating the trunk of an oak, which had withstood a storm which had prostrated its fellows. He at once saw that the tower would not be secure if built of squared stones, like an ordinary wall, but that the stones must be bonded together so as to form one solid mass; this was in principle, the same as Rudyerd adopted, but as the material used was different, the result had to be accomplished by different means.

A natural solution was to anchor the stones with iron bolts, but this idea was discarded as involving too great time and expense, and instead the original idea was invented of dovetailing the stones to the rock and to each other; in this way the lower courses would be riveted to the rock, and each of the upper ones be equivalent to one solid stone.

In addition, it was considered necessary to fasten the stones of each course more securely to each other so as to prevent all lateral motion among them, and also to fasten each course to the one below it. The first was accomplished by oak wedges; each stone had two grooves, cut from the top to the bottom of the course; these grooves were one inch wide and three broad; when the stone was accurately placed on its mortar-bed, and beaten down with a wooden maul, two wedges were placed in the groove, one point, the other head down; they were then driven home rather gently at first with a rammer; these wedges were three inches wide, one inch thick at the head, and three-eighths inch at the point. As the pressure of these wedges was lateral they solidified the course.

Each course was fastened to the one beneath with oak tree-nails, two one-and-one-fourth-inch holes were bored in the outer end of each stone at the yard; when they were placed and wedged, a hole one-and-one-eighth inch in diameter was bored in the stone beneath, and the tree-nail driven in, to insure its jamming tight in the lower hole, the lower end of the tree-nail was split and a wedge inserted, so that when it reached the bottom the wedge would expand it, and effectually tighten it, the top was then cut off flush with the top of the course, and two wedges at right angles to each other driven into it. All the outside joints were then carefully pointed, and the other joints filled with grout.

I have thus far described the general plan in considerable detail, but it would be tedious to recount all the devices used in bringing this structure to completion; for other information the reader is referred to the accompanying drawings. Every pains was taken that ingenuity could devise to make this tower so strong that the utmost power of the fiercest storm would have no effect upon it.

The light was first shown from the tower on the night of October 16, 1759. On August 5, 1756, the cutting of the rocks to receive the foundation was begun; from the time Rudyerd's light was destroyed by fire till the completion of Smeaton's tower was three years, ten months and sixteen days, the actual working time on the rock itself being one hundred and eleven days and ten hours. Notwithstanding the danger, difficulty and novelty of the undertaking it was completed without the loss of a single life, and scarcely with a serious accident. This was doubtless in a great measure due to the fact that Mr. Smeaton, the designer and builder superintended every part of the work himself, both on shore and at the rock, so that the workmen were never without his intelligent assistance.

When the gilt wall surmounting the lantern was brought from shore, he fastened it in its position with his own hands, standing on a scaffolding consisting of four boards nailed together in the shape of a square, and slipped over the top of the lantern, a workman standing on the opposite side of this precarious platform to balance Mr. Smeaton's weight.

I have been thus particular in the description of this tower, as it is the type of most all that have succeeded it on rocky sites similarly exposed; it was a magnificent conception, and so far as its inherent strength was concerned it might be standing until the present day.

The following inscriptions were engraved upon it. On the first stone of the foundation, 1757, over the entrance, 1758. Round the upper store-room upon the course immediately under the ceiling,

EXCEPT THE LORD BUILD THE HOUSE THEY LABOR IN VAIN THAT BUILD IT. Psalm cxxvii.

Over the south window, 1759; on the outward faces of the basement of the lantern,

✠ . NE. (door) . SE . S. SW . W . NW.

Upon the last stone set, being that over the door of the lantern on the east side,

24th AUG. 1759.

LAUS DEO.

In 1877, Sir James Douglass, member of the Institution of Civil Engineers, explained to the Institution the necessity for substituting a new light-house for Smeaton's famous structure.

There were two reasons — the first was that though the existing structure was "in a fair state of efficiency, yet unfortunately the portion of the gneiss rock on which it is founded had been seriously shaken by the incessant heavy strokes on the tower, and the rock was considerably undermined at its base."

The second reason was that in stormy weather the waves rise considerably above the summit of the lantern, thus frequently eclipsing the light and altering its distinctive character.

The latter defect was of but little importance for a long time after the erection of this light-house, but of late years when the coast lights were so much multiplied, and in addition all vessels carried signal lights, which formerly were not required, it now became a matter of absolute necessity that every coast light should have a reliable distinctive character.

In 1877, the Trinity House (the Light-House Board of England) determined on the erection of a new light-house and directed their Engineer-in-chief to submit a design and estimate of cost including the removal of the upper part of Smeaton's tower, that portion above the solid work; this demolition being necessary for the security of the lower part.

The site selected for the new tower was on the reef S. S. E. from Smeaton's light-house, about one hundred and twenty feet distant.

There was no probability of the rock being undermined here, as there was no surrounding point of attack at a lower level; the main drawback was that the lower courses had to be laid below the lowest tides.

The estimate was $390,000, but as the lowest bid from firms experienced in sea-work was considerably above this sum, it was determined that the Engineer-in-chief should do the work without a contractor.

By reference to the plate it will be seen that the general outline of the tower above the foundation was a curve, but that the face of the foundation was vertical; this change was made because it was found that the tendency of the curvilinear outline was to elevate the centre of force of each wave-stroke on the structure.

Therefore a cylindrical base was adopted and was carried two and one-half feet higher than the highest tides; the difference in height to which heavy seas rise on the two structures is very marked — this cylindrical base has the further advantage of affording a convenient landing platform.

The stones of the various courses are so cut as to interlock into each other, and were also fastened together with bronze bolts; the shapes of the stones differ from Smeaton's, but the principle is the same.

The first landing was made on the 17th July, 1878, when the site was examined and staked off for the workmen.

The first work done was to build a central core of rough granite laid in Portland cement; this core or platform was raised ten feet above low tide, and was of the greatest use.

For a radius of ten feet eight inches from the centre of the core the rock was cut in benches and cleaned, to prepare it to receive the foundation: around this and six inches from where the foundation would come a strong coffer-dam was built of bricks and Roman cement, the rocks were carefully cleared of all sea-weed with picks, and where they projected above the surface of the water strong sulphuric acid was used — every available moment by day and night was utilized in building this dam — it was seven feet thick at the base and its maximum height was also seven feet; three radiating walls were formed in the dam, (1) for strengthening the dam, (2) for reducing to a minimum the quantity of water to be ejected at each tide before commencing work, and (3) for affording, as they frequently did, a lee dam for carrying on the work, when otherwise it would have been impossible to keep the whole area free from water.

While those portions of the dam which were two feet below low water were building, heavy bags of concrete were first deposited along the outside of the dam — occasionally a few courses of brick were carried away, but the dam never suffered any serious injury.

[1] Continued from page 144, No. 561.

In connection with the work the twin screw-tender *Hercules*, one of the two steam vessels employed in the construction of the Great and Little Basses Rock Light-Houses at Ceylon, was used here; she was fully equipped with all necessary machinery and was moored about thirty fathoms from the rock.

The water was removed from the dam by two three-inch rubber hose, canvas covered and internally wired; they extended from the tender to the rock and the pumps of the tender, together with buckets used by the men, could empty one section of the dam in fifteen minutes.

No blasting was allowed for fear of damaging the rock, so all the superfluous rock was removed by drills, jumpers, cleaving tools and picks; this entailed considerable labor as each *face*-stone was sunk one foot below the surrounding rock.

A hollow wrought-iron mast twenty-five feet long and sixteen inches in diameter was firmly fastened in the centre of the work; two jibs were attached to the mast, one for landing the stone from the tender, the other for setting the stone; the drawing shows how these operations were performed.

This is probably the first application of floating steam machinery to the actual erection of a structure at sea.

By June, 1879, the work was sufficiently advanced to lay the stones in the foundation courses and everything was ready for H. R. H., the Duke of Edinburgh, Master, accompanied by H. R. H., the Prince of Wales, Elder brother of the Trinity House, Hon. M. M. Inst. C. E., to lay the foundation stone on the twelfth of the month.

The weather proved so boisterous that the attempt had to be delayed until the nineteenth of August, when the sea being fairly smooth the Royal party landed.

Prior to their arrival the dam had been pumped out and the stone, weighing three and one-fourth tons landed.

A bottle containing a parchment-scroll with full details of the work having been placed in a cavity under the bed of the stone, and the cement bed properly prepared, the stone was lowered and adjusted in position by the Master of the Trinity House, assisted by the Prince of Wales. The stone was then declared "well and truly laid" by his Royal Highness the Master.

Fair progress on the work continued during the working season of 1879–81, so that on the first of June, 1881, the Duke of Edinburgh landed on the rock and placed the last stone of the tower.

The interior fittings were carried to rapid completion, and early in the following year a temporary light was shown. In the meantime the new optical apparatus was installed, and on the eighteenth of May the Duke of Edinburgh completed the work by lighting the lamps and formally opening the light-house.

It takes a good deal of formality to get a light-house fairly underway in England.

The structure was completed within four years from the time it was commenced, and one year under the time estimated.

To give an idea of the force of the waves, a cannon six feet long and three inches bore, weighing ten cwt. was found at the base of the tower in the winter of 1881. It is supposed that it was one of those carried by the *Winchelsea*, whose wreck has been mentioned.

The Town Council and inhabitants of Plymouth were very desirous that that portion of Smeaton's tower which was to be taken down should be saved and reërected on Plymouth Hoe in place of the sea-mark established by the Trinity House. The Trinity House had no funds available for the purpose, but they delivered to the authorities at Plymouth, at the actual cost for labor, the lantern and four rooms of the tower; these were erected by public subscription on a granite base corresponding to the lower portion of Smeaton's tower, commemorative of one of the most successful, useful and instructive works ever accomplished in civil engineering.

The whole work was accomplished without the loss of life or limb to any person employed. The cost was $296,275, being $93,725, under the estimate.

This completes the history of the four light-houses on the Eddystone Rocks.

Relative Strength of Wet and Dry Timber. — In reply to a statement by the *American Miller*, that "wet timber is not as strong as dry, in some cases it has not half the strength of dry," a correspondent of that paper writes as follows: "In September, 1876, the Lanesboro mills, Lanesboro, Minn., burned, and that fall we rebuilt them and began making flour the next March. We used sawed pine (taken out of the Mississippi River), for joists 3″ x 12″, 12′ long, and sized them, laying them on top of the girders, to get their full strength, and then used ¾-match flooring. The joists were placed 12 inches from centre to centre, leaving 9 inches between them. In the fall of 1877 we piled wheat on the floor 26 feet deep in the bins, and the joists, yet wet and green, only sagged a trifle, and carried the immense weight safely. Two years later the same joists were dry, from the heat of our very large stove. We loaded the floor with 24 feet of wheat, and six joists broke off nearly square in the middle, and others were cracked. In the first instance the bins held 360 tons of wheat while the joists under them were green. When the joists were dry 300 tons or less broke several of them. This shows that green pine is stronger than dry pine, as the wood becomes brash or brittle by drying, and is not as strong as when green. This is caused by the sap drying and leaving only solid matter in the capillary tubes, and they cannot move one on another, while if the timber is green the tubes are full of water, and can bend or move one on another. I know of but two kinds of wood that are stronger dry than green, and they are maple and white oak."

ART IN ALSACE AND LORRAINE.[1] — II.

Early Renaissance architecture has left no relics in Alsace which may be compared with those magnificent châteaux which were the chief boast of the age in France; but the various cities of the province are rich in less ambitious works — town-halls and private dwellings. The graphic arts began vigorously to develop in the fifteenth century, and among local names which are reckoned to-day as some of the most notable of their epoch in Europe, I may cite Martin Schongauer, who so potently influenced Dürer, and Hans Baldung Grün, who, coming later than Dürer, carried on the same artistic phase.

Strasburg plays an important part in the history of printing and book-making; Gruninger being the most famous of her sons in this department, which then was an art as truly as those which now are more properly so-called. Wood-engraving also flourished in the province, and Estienne de Laulne, who was engraver and goldsmith at once, is familiar to us through that little cut of his representing the interior of an enameller's workshop, which has so frequently been reproduced in modern times. Dietterlin, who was born at Strasburg in 1541, was an architect and an ornamental draughtsman of great repute; collaborated in the erection of Heidelberg Castle, and has left an immense book of so-called architectural designs, which are the most extravagant and fantastic and unrealizable things one could well imagine, but not without a sort of pictorial attractiveness, by reason of the marvellous though wild inventiveness they show, and the clever and effective way in which they are engraved. In despite of M. Ménard's theories they are far more German than French in accent.

The sixteenth and seventeenth centuries, indeed, showed in Alsace a very German spirit in every branch of art — a fact which is exemplified, of course, by the mere citation of such names as Schongauer and Baldung Grün. But with the eighteenth century a French phase begins. Loutherbourg, the painter (very famous in his day) of animals and picturesque rural scenes and architectural decorations, has his place in the chronicle of French painting, and was regarded as a French artist when he crossed the channel to decorate Drury Lane Theatre. The other Alsatian artists of the century have names which sound now German, now French; but in their work are also thoroughly Gallic. One of them was Guérin, famous in Paris as a miniaturist, and another was Heim, who was very conspicuous there during the early years of this century, but is now remembered chiefly by his series of clever portrait-sketches representing the members of the Institute.

All the contemporary artists of Alsace, M. Ménard claims, without a single exception, as children of France; expressing his surprise, however, that under the circumstances such should be the case. A less partial eye will find nothing to surprise them in the list, for it will find that all its names are *not* French in spirit. The greatest of them, in truth, we may accord to the Gallic school — Bartholdi and Gustav Doré and Henner, for example. But Brion, wherever he may have learned or practised his art, certainly seems Teutonic of soul, as do Jundt and Lix and Pabst — all *genre* painters of the school which believes that elaborate is synonymous with good technique, and often falls into sentimentality in its search for sentiment. Steinheil, on the other hand, I should be inclined to call French again—alike in his *genre* paintings and in his designs for stained-glass, conspicuous among which last are the reconstructed parts of the windows of the Sainte-Chapelle. The well-known Kierstein family of goldsmiths were Alsatians, and an Alsatian is the porcelain-maker Deck.

Passing now to the sister province, we learn that in the Middle Ages its art was much less important than that of Alsace. The great epoch of Lorraine began with the dawning of the sixteenth century, and the ducal palace at Nancy is the most important monument of the age. The most interesting feature which still survives (much of the palace having been destroyed) is the great door executed by Mansuy Gauvin, in the transitional style. Another interesting building in Nancy is the Hôtel Lunati, with a richly carved

[1] *L'Art en Alsace et Lorraine.* Par René Ménard. Paris: Librairie de *L'Art*: Charles Delegrave. Continued from page 134, No. 560.

and arcaded front, built in the early years of the seventeenth century. Both these works and also an elaborate street-well, pictured in the book before us, seem to me to show very distinctly the signet of the German rather than of the French Renaissance.

The greatest local sculptor of the Renaissance — Ligier Richier — belongs, on the other hand, to France, though even his works are not free from a Teutonic flavor. Specimens of his work may be seen in the Louvre, but his most important creation is in the town of Saint-Mihiel — the sepulchre of the saint of the same name in the Church of St. Stephen. It represents an entombment, and is composed of thirteen figures, larger than life, cut in very high relief from a stone which very closely resembles marble. The extremely skilful composition, and the noble, if somewhat "tormented" flow of the draperies show the influence of the Renaissance, though the general feeling speaks of the indigenous art of an earlier day, and the architectural details of the background are Gothic. Technically speaking, the work must be very remarkable (it is reproduced in a beautiful etching in our volume), and its charm of sentiment is also so great that I wonder it is not more generally included among the greatest masterpieces of the period. The "Judgment of Daniel," which is attributed to the same hand in the catalogue of the Louvre, is much more classic in effect, and shows architectural details of a rather heavy Renaissance type. It looks so much later than the sepulchre, that one would hardly guess them to have had a common creator; but, as is well known, the artists of that time often radically changed their manner between the earlier and the later years of their activity. So strong is the Northern accent of both the works, however, that one does not put much faith in the story that Richier studied in Italy — even, it is popularly said, under Michael Angelo.

I have already spoken of Mansuy Gauvin as the architect of the door of the ducal palace at Nancy; but in ancient documents he is spoken of as a "*menuisier*," so we may conclude that his contemporary fame rested chiefly upon sculptures in wood. Among other Lorrainers of celebrity I may note Woeriot, metal-worker and ornamental designer; and the Briots, who were among the most famous of the goldsmiths of the period. A ewer in the Cluny Museum at Paris is a very beautiful example of François Briot's art, executed in the style of Cellini a few years after his death, somewhere about 1580.

The painters of the seventeenth and eighteenth century in this province are altogether French, alike in name and art. Most famous among them are Callot and the prince of landscape painters, Claude. And the same is true of the modern school. Bastien-Lepage may head the list, and it includes such others as Feyen-Perrin, Français, Isabey, Jacquot, Laurent, Hector Leroux, Maréchal (who may be cited as the first pastellist to attempt landscape work, though this is by no means his only title to honor), Trayer and Yvon — truly an honorable showing for any one province, though I have repeated only the most conspicuous among local names.

Taking up now the topographical sections of the work, we find, of course, that much space is devoted to the city of Strasburg. Despite its checkered history, it has preserved, to an unwonted degree for so large and flourishing a town, its old-time aspect. Of the great cathedral, which shows the consecutive labors of four centuries, I need hardly speak in greater detail, for no existing monument is better known or more fully appreciated. Next in importance to this comes the Church of St. Thomas, now devoted to Protestant uses. It is in great part Romanesque, and one of its towers is claimed for the eleventh century. In this church is Pigalle's well-known monument to the Maréchal de Saxe, and — much more interesting from the true artistic standpoint—a chest-like tomb, said to be that of Bishop Adeloch, which is a most beautiful example of ninth-century sculpture. It is supported by grotesque animals; the sides are adorned with an arcade, the openings of which are filled by the most curious and diverse figures, and the inscription on the lid (which includes the date DCCCXXX) is disposed in a singularly decorative fashion.

The so-called "New Temple," which was destroyed in the German bombardment, was in reality a very ancient edifice. In 1824 a most curious "Dance of Death," encircling two walls of the church, was discovered beneath thick coats of whitewash, and the loss of the building is therefore doubly to be deplored. The church of St. William contains many interesting mediæval monuments, and among later works may be named the château (built 1728–1741, by the cardinal-prince Rohan, bishop of the town), the prefecture, the theatre, etc. The picture-gallery of the city, which held many fine Italian as well as northern and local works, was destroyed in the last war, together, as has already been noted, with the rich museum of antiquities, and the library, which contained one hundred and fifty thousand volumes and about sixteen hundred manuscripts, and had few superiors in Europe in the direction of precious illuminations and miniatures.

The town of Hagenau contains several interesting churches, one possessing considerable remains of early Romanesque date. The church of St. Peter and St. Paul, at Wissembourg, is of the thirteenth century, but preserves a tower from a more ancient time, and from here may be visited many of those commanding ruined châteaus which, standing amid the most picturesque scenery, are so frequent all through the province. Saverne is a very ancient town, already important in Roman days, and possesses a considerable museum of Roman and pre-Roman antiquities. Its parochial church shows portions dating from almost every mediæval epoch, while its episcopal palace is a huge and splendid work in the French fashion of the later eighteenth century. It was never completely furnished, owing to the breaking out of the Revolution, and is now used as a home for the widows of public functionaries. In the neighborhood of Saverne are the ruins of the two châteaux of Geroldseck, in one of which there is a well-preserved room with round-arched vaulting, supported by square pillars, which seems to be of the eleventh century.

The abbey-church of Marmoutier is one of the most important in the province. The interior is not earlier than the fourteenth century, but the fine façade and the three towers are Romanesque, of a simple and stern, but noble type. Our author attributes the façade to Drogon (already named as a natural son of Charlemagne), who was bishop of the town in 825; but in the illustration it does not appear to be so extremely early a work as this would imply. Not far from the town is the Abbey of Neuwiller, to which is attached the Church of St. Peter and St. Paul. Parts of it date from the twelfth century, and the chapel of St. Sebastian, which is attached to the choir, is of the Carlovingien period. It consists of two superimposed apartments, and in the lower, or crypt, is a baptismal tank large enough for the immersion of converts. The carvings of the upper chapel are of a rich Byzantine type. Another church at Neuwiller is also very early Romanesque; but the most charming Romanesque monument of the neighborhood is the church at Rosheim. It dates from the twelfth century, and in general composition, as well as in the design of its main features, has a very early and a very south-French accent; but its sculpture is so profuse and so beautiful, and the profiles of its bases and cornices are so pure and charming, that it is accorded by an architect of local birth but European authority — Boeswilwald — a quite exceptional place among the structures of its time and neighborhood. It is singularly free from later additions, the only pointed work which shows in the external view being in the upper stage of the octagonal central tower.

The finest ruin in Alsace is the Castle of Haut-Koenigsberg, near Schlestadt. It was built in the shape of a very long parallelogram, divided into three sections, the central one of which was devoted to domestic purposes, while the others formed the defensive works; and this, we are told, was the usual form of such castles in the province. Many portions are still in a fair state of preservation. Not far away is the Mount of St. Odile, which is very lofty and affords a magnificent outlook over innumerable hills crowned with ruins. On its plateau are the remains popularly called "the pagan walls." There apparently once existed here an enclosure measuring some ten thousand metres in circumference, and composed of rocks connected together by rude masonry of cyclopean aspect. And together with these relics of unknown antiquity are traces of Roman roads and isolated stones, like the menhirs and dolmens of Brittany. The mount takes its name from a famous saint who established herself here in the seventh century. The monastery (of course not of her date) still stands and is even to-day a favorite place of pilgrimage.

Ribeauvillé is a small town which preserves much antiquity of aspect. Several of its buildings are very interesting, and its little museum contains a number of beautiful Renaissance vases, which convincingly show the skill and taste of the local school of goldsmiths. The series which they represent was the gift of successive generations of the seigneurial family of Ribeaupierre. Unfortunately the mediæval examples have perished, and the most splendid cup of all — a huge sixteenth-century work measuring nearly a metre in height, and ornamented with many figures — is to-day in Munich. The grandfather of the present king of Bavaria claimed it, upon his succession, as a family heirloom, for he was of the blood of the Ribeaupierres.

All the towns I have thus far noted stand in the neighborhood of Strasburg, but the Alsatian city which is most important after Strasburg itself is Colmar. The architects of its cathedral have already been named. The greatest pictorial treasure of the town hangs within it — Martin Schongauer's famous "Virgin of the Roses," reproduced in M. Ménard's book in a charming etching by Greux. The town-hall is a somewhat simple but interesting early Renaissance or more properly transitional work. Its Gothic elements show none of the extravagance we often find in transitional work in Germany, but even our author cannot but remark that the close-set row of square-headed windows, divided only by pilaster-mullions in the upper story, has a German rather than a French aspect. Many charming Renaissance houses still survive in the narrow winding streets of Colmar, though their number is being diminished year by year. One, which dates from 1538, is the ancestral home of that Haussman family to which belonged the great "improver" of Paris. The house of the Knights of St. John is an early Renaissance work, much more French in expression than most of its neighbors. It shows a low, round-arched portal, and above, two superimposed arcades, also round-arched, opening into *loggias* and surmounted again by a classic balustrade. All these features are very plainly treated, but in upper arcade the supporting columns stand upon an open parapet of rich flamboyant design. The effect is very curious, and, though picturesque, rather "patchy." But what interests us most in the composition is the striking instance it gives of that similarity in general effect which often exists between early-Renaissance features and Romanesque.

M. G. van Rensselaer.

THE ILLUSTRATIONS

Contributors are requested to send with their drawings full and adequate descriptions of the buildings, including a statement of cost.]

THE CYRUS W. FIELD BUILDING, BATTERY AND BROADWAY, NEW YORK, N. Y. MR. E. H. KENDALL, ARCHITECT, NEW YORK, N. Y.

[Gelatine print issued only with the Imperial editions.]

THE THEOLOGICAL SEMINARY, NEW YORK, N. Y. MR. C. C. HAIGHT, ARCHITECT, NEW YORK, N. Y.

[Gelatine Print, issued only with the Imperial Edition.]

WORK OF THE STUDENTS IN THE CLASS IN DECORATION AT THE MUSEUM OF FINE ARTS, BOSTON, MASS. INSTRUCTOR, MR. C. H. WALKER, ARCHITECT, BOSTON, MASS.

SMEATON'S LIGHT-HOUSE.

For description see article on "Ancient and Modern Light-houses."

A SCULPTOR'S STORY.

From L'Art.

WHERE are very few people in Paris who do not traverse the Boulevards a great many times in every month, and as all passers-by are sure to gaze at the windows of the shops where bronzes are sold, it may be concluded that there are very few people in that city who are unacquainted with the figure of "François Villon," by M. François Etcheto, although they may not all have seen the original in the Square Monge. Villon or Corbeuil is a poet who has found devotees of late in England no less than in France, and his sincerity of utterance, however low may be the subjects, has an undoubted charm, especially if it is remembered that he was born four hundred and fifty years ago, when people were afraid to express their thoughts. But, apart from that, Villon is an important figure in French literature. The respectable Boileau, who was not disposed to be friendly to poets who were deficient in the moral sense, says that Villon was the first of the Frenchmen who practised poetry as an art:

> Villon sut le premier, dans ces siècles grossiers,
> Débrouiller l'art confus de nos vieux romanciers.

The life of the poet was more sad than any that Johnson related, unless we make an exception in the case of Richard Savage. Villon was an university scholar, but somehow his acquaintance with Aristotle and Averroes brought him no office. Like Jack Falstaff, he came to believe that thieving was his legitimate vocation. But, unlike the English knight, Villon came under the "rusty curb of old father antic the law." He was put to the torture, and was twice condemned to the gallows. Strange to say, the cold-blooded Louis XI always intervened in his favor, but no honest employment was provided for the poet. However, a priest was inspired with pity for Villon; he was carried off to the provinces, and there spent what was left of his life in peace and comfort.

Villon was thus a poet for whom the gutters of Paris served instead of the Pierian spring, and as a thorough representative of the Quartier Latin it was only fair that his image should appear before the eyes of students of a later age. The statue that adorns the Square Monge is as characteristic as any piece of portraiture in the city. Villon becomes suggestive partly of the feathered Mercury and partly of the *gamin de Paris*. As he stands he inclines a little to the left side, for a perpendicular pose, however well suited to a mathematician or a politician, would hardly correspond with the mode of thought of so peculiar a moralist. We know that "every true man's apparel fits your thief," and a tailor would be sure to say that Villon never was measured for the habiliments he is made to wear. But the short overall answers well for the concealment of thievery of an obtrusive kind, and, moreover, the loose folds may be a protection against an occasional pass of a rapier. The lute at the feet suggests the minstrel. The matted locks reveal he is one that comfortable citizens would consider to be of a disreputable class, who has often slept in the open air for want of a roof, but the keen eyes and the sensitive lips denote a spirit who could see beyond the shows of things. For Villon was able to moralize with the best over the riddle of life, and the talk of Hamlet in the graveyard is marvellously like what we might expect from a man who had just been reading some of the verses of the scapegrace. Our English experience suggests the difficulty of making a statue of a poet. Burns in Dundee, Tom Moore in Dublin, the crowd in Poet's Corner, all testify in that way. Abroad there are also figures of poets that offend the eye. Indeed, in all Europe we doubt if one can be discovered which is as expressive as M. Etcheto's "Villon."

If, on seeing the statue, any one might ask about the sculptor, the information would not be readily obtained. Strange to say, this marvellous work is one of the two which are all that are forthcoming to represent the powers of so able an artist. The second is a figure of "Democritus," of which the marble copy was to be seen in this year's *Salon*. M. Etcheto is at present an invalid. The misery which sometimes awaits sculptors as well as poets was his lot, and it overcame a frame that was frail by nature. Thanks to the intervention of M. Paul Leroi (and it is not the first time his influence was exerted in behalf of unhappy artists), M. Etcheto was rescued before he was overwhelmed. He is now at Pau, and every one who loves art must wish that a man whose genius is unquestionable may shortly be restored, and be able to endow his country with noble works. In the "Villon" we see only the 'prentice hand of the sculptor, and from such a beginning we expect much. In the last number of *L'Art*, M. Paul Leroi modestly relates the story, keeping himself as much as possible in the background:

"When M. Etcheto exhibited his plaster models of the 'François Villon' and the 'Democritus' in the *Salons* of 1881 and 1883, I was," says M. Leroi, "very favorably impressed by them. M. Eugène Guillaume, and subsequently M. Ernest Barrias, the sculptor, expressed to me how deeply they sympathized with the sufferings endured by one who was a genius of the rarest class. Having admired the artist, I was eager to become acquainted with the man himself. I found M. Etcheto overcome with fever, and shivering near a handful of fire in a damp studio, that was close to the fortifications, and which became more dreary when one remembered that it was within a hundred yards of the elegant mansions of the painters in the Avenue de Villiers. He was without any commission, but in spite of his illness and misery he was modelling with a trembling hand a small figure of a woman, to which he imparted infinite distinction. I was heart-broken with what I saw. I promised to come again, and when I did I had the good fortune to be made the bearer of a commission for a reduction in marble of his "Villon," which was offered by an eminent amateur (the Baron Alphonse de Rothschild), who, having become a member of the Institut, signalized his election by a generous and delicate encouragement of the sculptor's art. Sculpture is to-day the most marked glory of French art, but its votaries are badly recompensed — as, indeed, they have rarely been otherwise.

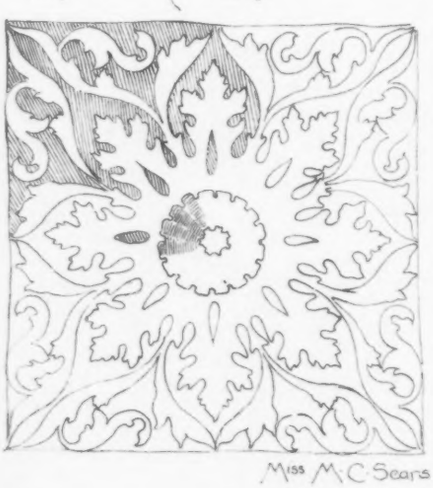
"M. François Etcheto was enabled to remove to a more habitable studio in the Rue Aumont-Thiéville. Unfortunately for him, the change was too late. His weakness had increased, and it was no longer possible to have any illusion that it was to be of a short duration. He continued, however, to work without any abatement of fervor; this time it was on the reduction of the "Villon." I counselled him to take some repose, assuring him that nothing could be more contrary to the desire of the patron whom I represented than his struggle to execute the commission in spite of his illness, and by which he was aggravating the danger. My efforts were all in vain. Having accepted the price of his statue in advance, M. Etcheto felt that he was bound to uphold the dignity of his art by completing the work. When it was ready, then he could be free. He held to his resolve in spite of all my entreaties; but I could not help feeling respect for him, while I feared the consequences of his honorable conduct.

"I resolved to bring the case before a lady artist whose position in the great world is only employed in efforts to make people happy. Endowed with the highest intellectual gifts, her heart is as large as her intelligence, and this lady renders a service in a way that suggests the recipient instead of the donor of a benefit. I knew of some of the cases in which men of letters had been aided by her kindness, and how, also, artists had reason to bless their 'bonne camarade.' I had, therefore, no misgiving about the result of my appeal. I was

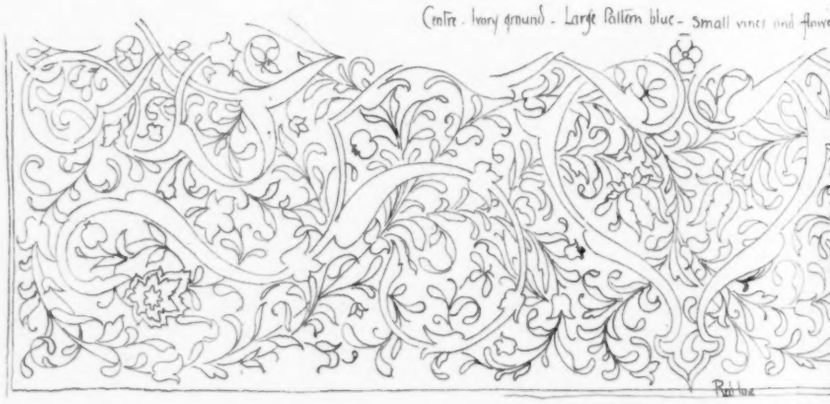
COPYRIGHTED

Design for Panel and Border.

Miss C. Goldthwaite.


Design for Tile for Wall Surface only
Pattern slightly raised from ground -
Ground Deep Blue green Glaze - grained greener towards centre
Ornament in dull russets and reds -

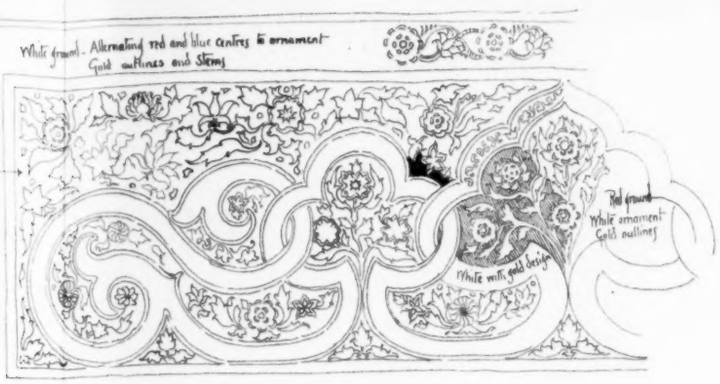
Miss M. C. Sears



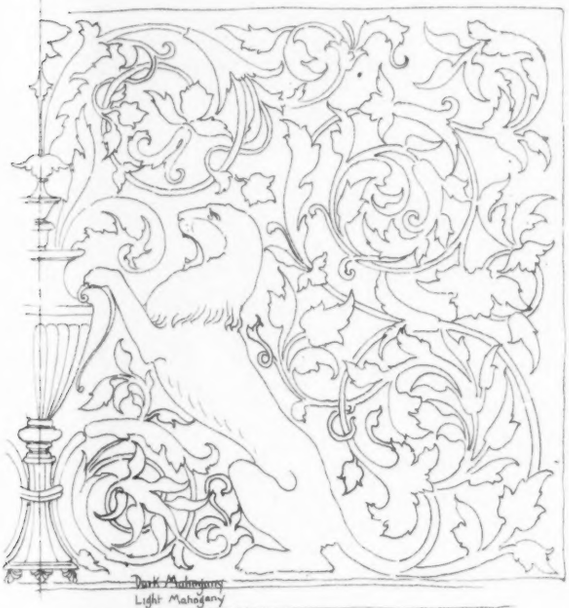
Design for Rug - Miss C. Goldthwaite

WORK OF THE STUDENTS OF THE CLASS OF DECORATION AT THE MUSEUM OF FINE ARTS, BOSTON, MASS

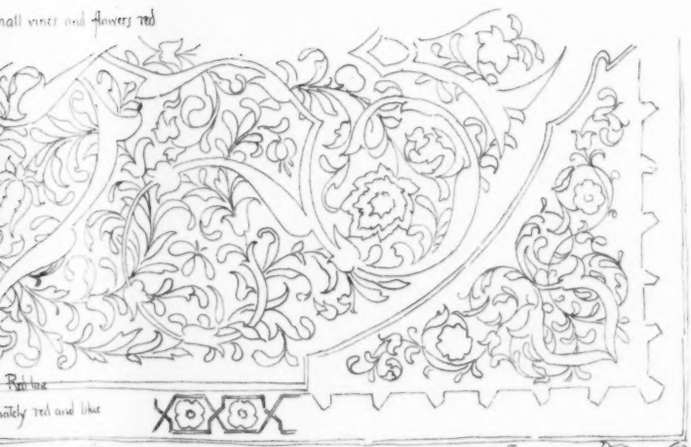
PUBLISHED, 346, STRAND, BY HORNOR & CO.



Miss Lois Howe



Design for Inlay Miss C Goldthwaite.



C. Goldthwaite

Design for Rug

Miss M.C. Sears.

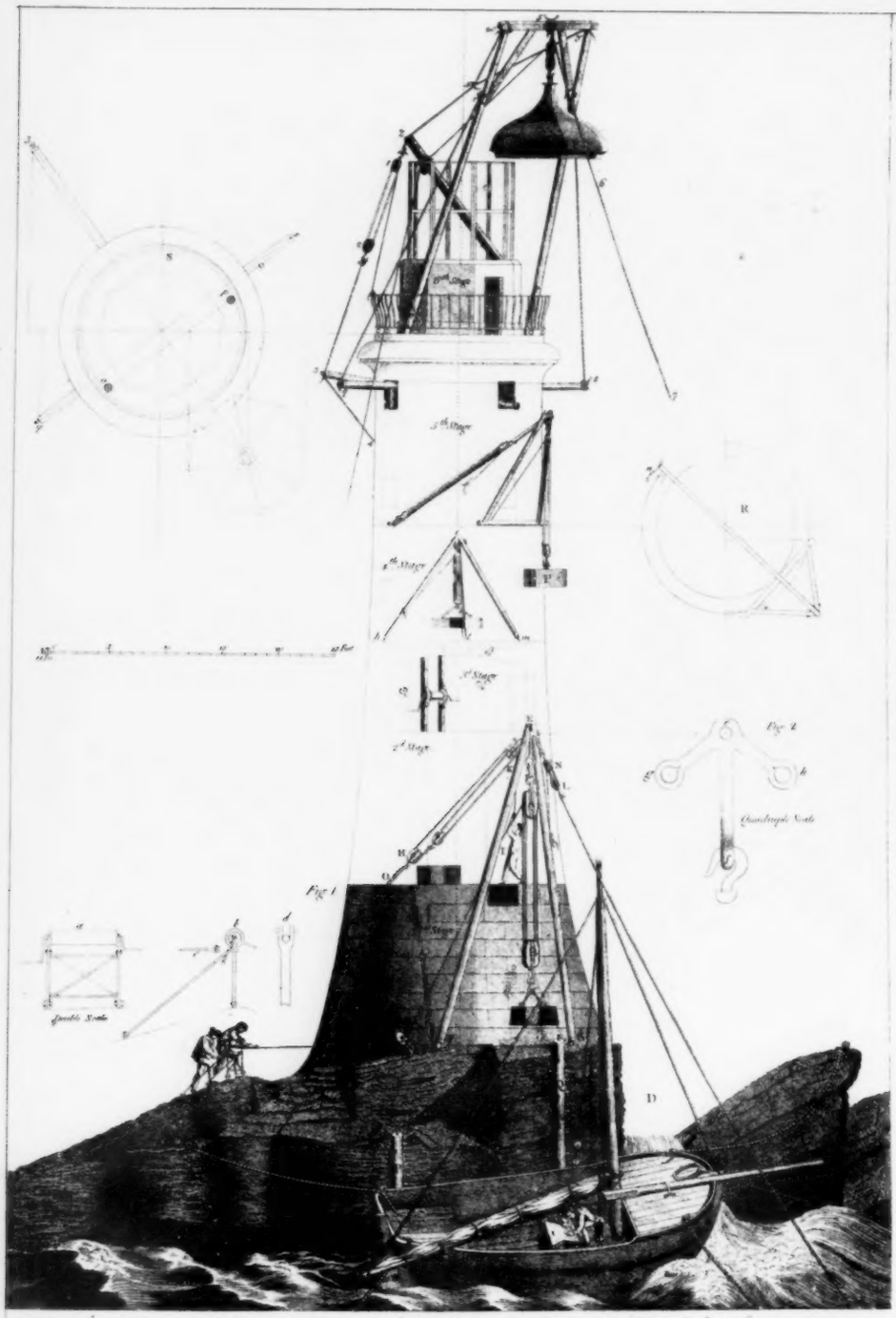
Blue Border

ORATION

STON, MASS.

C. HOWARD WALKER, INSTRUCTOR.

COPYRIGHTED 1888, TICKNOR



A View of the **ROCK** *on the* **EAST SIDE,** *and of the* **WORK** *advanced to Course* XV *being the first of the* **ENTRY COURSES,**
Shewing the manner of **LANDING** *and* **HOISTING** *the* **STONES** *&c. in every Stage of the* **BUILDING.**

The Engine by M.C.K. Riker. *J. Rawet fculp. 1786.*

IDEAS, HINTS, & SKETCHES,

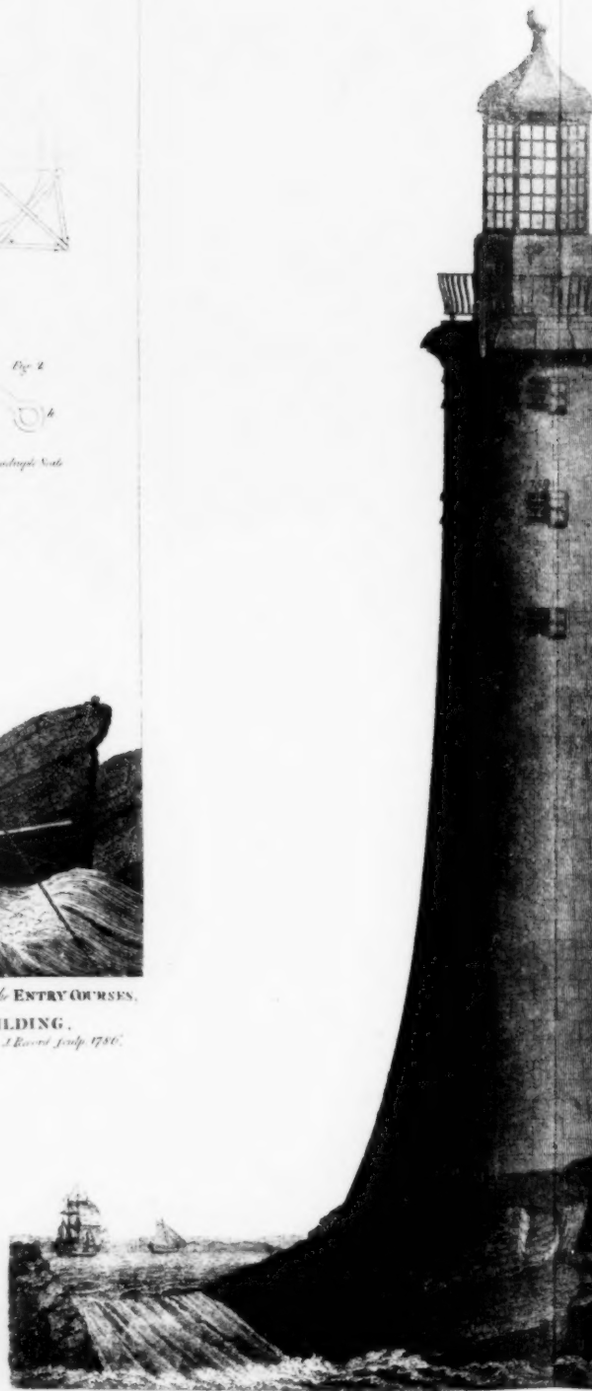
from whence the FORM *of the*

PRESENT BUILDING *was taken.*

J. Rawet fculp. 1786.

Fig. 1.

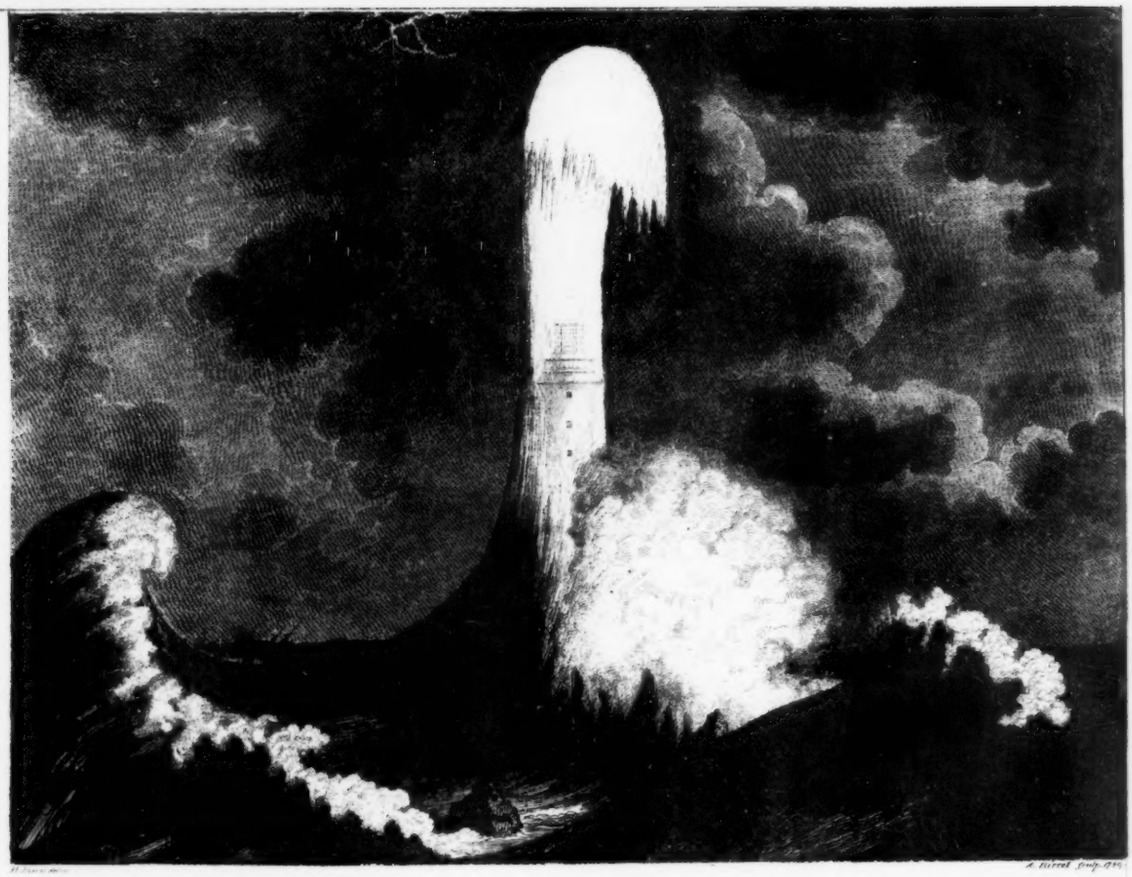
Fig. 2



South **ELEVATION** *of the* **STONE LIGHTHOUSE**

Shewing the Prospect of the nearest Land

HITE, DREW, TICKNOR & CO.



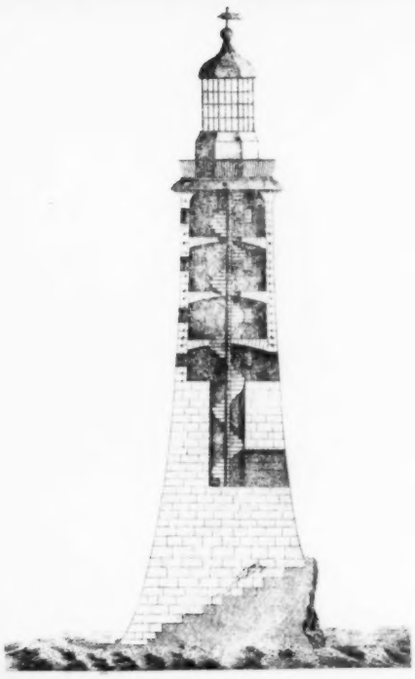
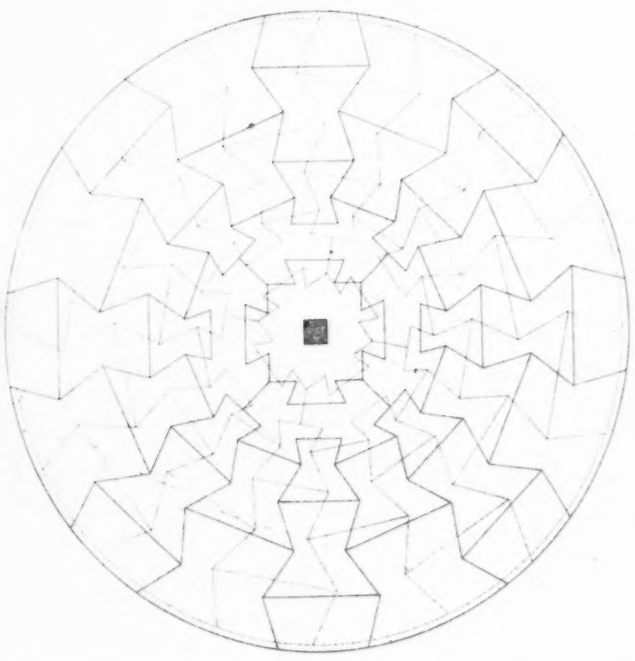


Fig 4.

Fig 3.



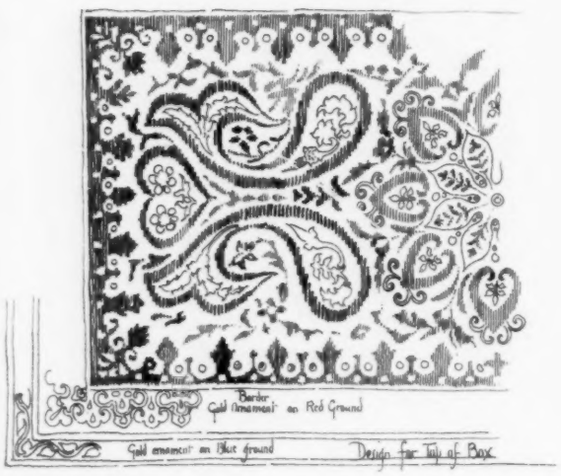
IGHTHOUSE *completed upon the* EDYSTONE *in 1759.*

t Land will appear from the Rocks in a clear calm Day.

Engraved in the Year 1760 by M. Ellis' Broker. The figures by M. Sens. Sculp.

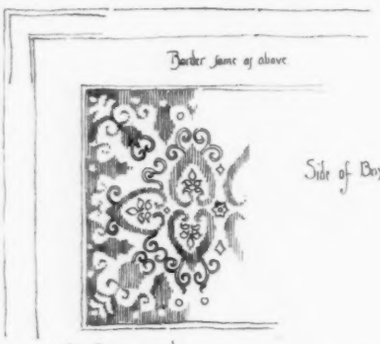
Heliotype Printing Co. Boston.

COPYRIGHTED



Design for Fan

Miss M.C. Sears



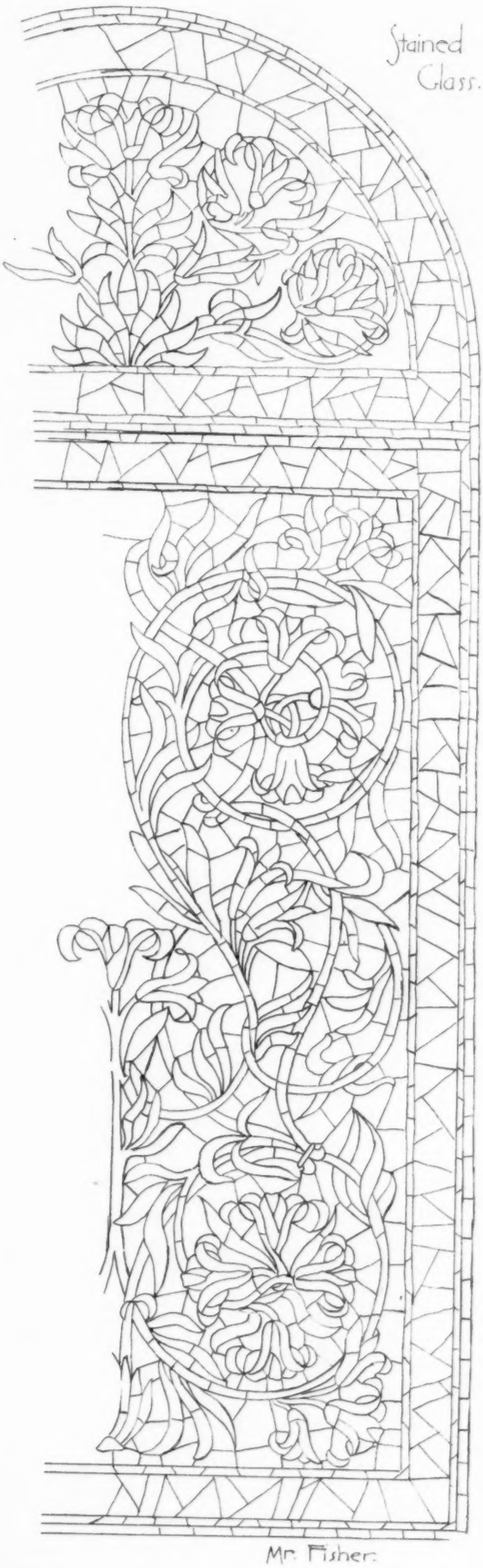
Miss Sears del

WORK OF THE STUDENTS OF THE CLASS OF DECORATION
AT THE MUSEUM OF FINE ARTS, BOSTON, MASS.

C. HOWARD WALKER, INSTRUCTOR.

One quarter of Design for Sofa Cushion - Miss. C.M. Pratt.

Stained Glass.



Mr. Fisher.

Velvet - with red base and greenish nap -

Design for Portiere Miss M.C. Sears.

Heliotype Printing Co. Boston.

hardly allowed time to state the circumstances before I was asked to return to the Rue Aumont-Thiéville and to order the invalid to depart forthwith to Pau, and there to entrust himself to the intelligent care of Dr. Meunier.

"The friends of M. Etcheto will be glad to learn that at Pau his health improves from day to day. Before leaving I asked him for a few autobiographical notes, and I have received the following in a letter dated November 16, 1885:

"'I was born of French parents in Madrid in 1853. I have gone through five years of military service. While stationed in Paris I was more or less able to attend the classes of the Ecole des Beaux-Arts. I belonged to the Atelier Jouffroy. It often happened that M. Jouffroy (whom I did not recognize as the professor) came beside me to give his advice to other students. I was entirely ignored. This conduct irritated me against him, and when I exhibited my "Villon" I did not describe myself as his pupil, but as "Etcheto, élève de l'Ecole Nationale des Beaux-Arts de Paris." That was my way of protesting. Although both M. Dubois and M. Falguière inspired me with admiration, I feared to be troublesome, and therefore have had little to do with them. I was in this way deprived of advice which might have made something of me. I know my deficiencies and must follow my unambitious career. When I compare myself with some of my friends who have vigorous constitutions, a supreme enthusiasm, and an undaunted courage, I often doubt if I am born to be a sculptor. They can produce works unceasingly, while I have made two statues. I have executed only a single bust that was commanded by the State. It is mediocre in character, for it was taken from an engraving, and I am not eager to undertake another work under such unsatisfactory conditions. In short, I am not an able man. I am deficient in knowledge, and am a slow workman. I forget myself in a contemplation of my model, and don't advance. In this way my works have cost me dearly. I am more disposed to study, or rather to produce no more than studies when treating a subject, and I make and destroy with the same outlay of nervous force, which becomes a very great fatigue. You ask how was my vocation revealed to me? I believe it was while trying to make my "Villon," for before that time I was unable to finish a single study in the atelier, and one of my comrades, named Dampt, therefore used to call me "le lâcheur." I must say, however, that he has shown himself to be a sincere friend, and I heartily admire him. It was while alone in my atelier, in the Passage Dulac, standing before a work of which I could not foresee all the difficulties, and with scanty resources at my disposition, that I drank, once for all, the bitter cup, and if I was brought to comprehend how hard was the sculptor's life, I was also taught to love it as the greatest of the arts.

"'I fear I am unable to say anything interesting concerning myself. I have an afflicting remembrance of the deception that I felt in returning to the ateliers of the Ecole des Beaux-Arts. I was full of faith in my art. I expected to enter in a sanctuary, and, instead, I became a witness to all the stupidities of which ill-educated men can be capable. I have been harmed in this environment. I have lost my time and my best illusions. But what was to become of me if I remained in Paris and did not accept the offer of my benefactress? It gives me great pleasure to think sometimes that I may be able to do something to satisfy her intention. Do not forbid me, for I know the extent of my powers. Gratitude may double them, and then I shall have the happiness to produce something that may be called good sculpture.'

"This is no idle dream, for, if M. Etcheto recovers his health entirely, we may expect some additions to the two remarkable creations which have gained him so high a place among French artists. We have a right to expect much from a man who is described by one of the most clear-sighted of his friends as having the most superb artistic visions, which he timidly recounts, as if his enthusiasm were a failing which was sure to be ridiculed, and which are followed by a state of mental depression that is almost incredible. But the power that is exemplified in the 'Villon' and 'Democritus' leaves a hope that the sculptor will surmount all despondency, and reveal his strength in realizing one of his dreams, which is the model of a woman palpitating with life. He will then be able to express the treasures of poetry which vibrate in him, and which for a time have to be suppressed."—*The Architect.*

A Tunnel from Sweden to Denmark. — Mr. Alexandre de Rothe, an engineer who has been working at Panama under M. de Lesseps, has presented to the governments of Denmark and Sweden a project for a submarine railway tunnel under the sound between Copenhagen and Malmo. The tunnel is to have a total length of twelve kilometers — three between Ameger and the small island Saltholmen, under the Straight Drogden, and nine between Saltholmen and Sweden. The ground to be worked much resembles that in the channel between England and France, and is said to offer no difficulty to the execution of the work. The cost of the construction is calculated to amount to 30,000,000 francs, or £1,200,000. The Swedish government takes a great interest in the plan, while the Danish at present is keeping somewhat back. Mr. de Rothe entertains sanguine hopes of a successful result of the negotiations. The tunnel would be of the greatest importance for the future commercial connection between Sweden-Norway, and later on of Russia and the whole continent, as laden railway wagons could then run from the north of Norway, Sweden, or Finland down to the south of Italy.— *Copenhagen Correspondence London Standard.*

ON WORKS OF ART FROM THE POINT OF VIEW OF OTHERS THAN ARTISTS.

FROM THE ENTRANCE OF A CHURCH AT NUREMBERG

REVUE DES ARTS DECORATIFS

AMONG other characteristics of encouraging progress within the experience of the present generation, very noteworthy is a movement for the establishment not only of metropolitan, but of provincial and municipal, museums and galleries of fine art. The public spirit no less than the personal pride of the wealthy, has seconded the popular interest and enthusiasm, which have allowed the devotion of considerable national funds to such purposes. The promoters of these institutions have been laudably anxious to secure a standard of high, of lofty excellence, in the works which are assembled; it has also been an object to embrace the excellence of a diversity of arts and a variety of styles.

Opportunities of acquisition have not been wanting; the vicissitudes of states and governments and of private families also, continue to supply them with considerable frequency. Collections made by the enthusiasm of ancestral dilettanti tend to dispersion under the influence of necessity, indifference, change of taste or prudence. Rents decline, families multiply, investments are tempting, a plunge on the turf is disastrous, and libraries or sculpture galleries unused and unappreciated, except for the pride of possession, give forth their treasures "to wander heaven-directed" to those who can truly understand and, often, better value them. Even the sanctity which was supposed to hedge round heirlooms has proved no safeguard against reasonable legislation; and the sound of Mr. Manson's hammer is heard in noble houses, as impartially as, Horace is ever unpleasantly fond of telling us, the knock of the foot of pallid Mors beats the doors alike of palaces and hovels.

That the boon of accessible collections of masterworks in art should be valued by the ever-increasing students of art, is to be expected and natural; and how they may make the best use of the boon is a subject of great interest, a subject however, which under the interest of another shall here be left aside. The question may be naturally and earnestly asked by a still more numerous class, how shall we who are not, and are not likely or anxious to be, artists either professionally or as amateurs, not derive all the enjoyment and advantage from these exhibitions which it was the hope and the aim of the artists themselves to confer?

Certain it is that many are capable of deriving the truest and purest pleasure from art, who when first they are confronted with it, and even especially with its more renowned examples, find themselves strangely indifferent if not repugnant, bewildered if not puzzled. But in these days of criticism, they are not likely to be in want of advice. The professional critic is as near their elbow as the proverbial tempter of idleness. His assumption of authority is supreme, and his promises of instruction are as extensive and mellifluous as those which the Ithacan resisted with such difficulty:

Hither away, highly-lauded Ulysses, great pride of Achaians!
Stay the course of your ship that you may list to our voices,
For never as yet has one in his sable ship passed by here,
Before having heard from these lips of ours the mellifluous voices;
But away he has gone after having delight and with knowledge extended.
For in truth we know all things, whatever it was that in spacious Troia
Argeians and Trojans with travail endured by the gods' appointment
And all things whatever we know that arise upon earth prolific.
[Literally and lineally translated.] — *Odyssey* xii, 184.

If the disciple gives in to the voice of the charmer, he will be apt to find himself presently taken in hand to some purpose, and fitted with a pair of blinkers which will allow him to see nothing to the right or left, and not too much in front of him. "Bow down," he may perchance be told, "to Carpaccio, to Botticelli, to Tintoret, Titian, eschew Rembrandt, Rubens, Claude; allow but slight allowance and little time to selected works of Raphael and Michael Angelo as

compared with Dürer and Giotto; accept my superlatives both of enthusiasm and supercilious contempt; and if, as time goes on, I seem to have been feeding you with husks, be assured that the fault is in your own unhappy incapacities of ingestion and digestion."

It may well be a relief to turn to another guide of large sympathies and even intellectual scope. His interests in art are universal; he regards and values all masters and all schools; for can he not trace throughout, the subtle interchanges of an historical development? And widely as his survey extends, it penetrates no less deeply; there is a microcosm of art as well as a macrocosm. Within the range of a single school, nay, within the career of a single master, how many nuances of style may not be distinguished; what fine distinctions of manner before an acme is attained, and then how many more in the progress to decline. And he will as eagerly insist that the scope of historic view must not be confined to the studios, or even to social characteristics; he will read all contemporary history, all prognostications of revolutions in politics and morals, into or out of pictures, statues and poems. "All are but parts of one stupendous whole," and no part can be understood and appreciated to any good purpose, unless on a principle of comprehensive illustration.

These critics ever make it the most important point of all in the arrangement of an exhibition, that the pictures shall be arranged in chronological order; to this considerations of subjects and symmetry, or of interference by harsh contrast, and it is well if not also of appropriate lighting, must give way. Only thus we are told can be cultivated — and what, it is thought, can be more important — the faculty of deciding at a moment on the period of an artist's life and art to which a particular work is to be assigned, and of disserting upon the succession of his methods and evolution of his processes under reaction from his contemporaries. Gaps will occur in such sequences; but the critics may be trusted to bridge the intervals with theories that dispense with dependence on the vagaries of talent or infinite versatility of genius.

Not that there is not much in the study of art from this point of view that, when skilfully and soberly conducted, is not worthy of esteem. But it is work of specialists; in its nature it is subordinate to that study which will give true guidance to the recognition and appreciation of the beauty for which alone all true art exists. Let the specialists discuss such matters among themselves, and report results for the benefit of the general world, when they find themselves approaching to agreement. Usually they provide for those who are far beyond the earlier stage of novices but windy provender: "the hungry sheep look up and are not fed."

The general world for whose behoof public exhibitions are chiefly though not exclusively instituted, goes to fine art, and wisely, less to be instructed than delighted—it expects beauty not to lecture but to charm them; it assumes a frame of mind less prepared to understand than to enjoy.

Understanding, a measure of even special information and intellectual furniture generally, cannot be dispensed with. But what is requisite does not concern technicalities and antiquarianism, but chiefly what is indispensable to enable the spectator to apprehend the conditions on which the pure æsthetic enjoyment of the several works of art depends. And the spectator would fain be allowed to make up his mind upon one work of art at a time.

The most salient characteristic of a work of art may be an incident more or less complex, a simple action or a sentiment. These distinctions are exhaustive if liberally interpreted; but they are not to be pressed into too positive separation amongst themselves. "A Battle of the Amazons" by Rubens, a conversation piece by Terburg, a landscape of Claude or a portrait of a lady by Reynolds, may serve as exemplars. The interest of the portrait seems dependent on pure sentiment; but sentiment, which is a phase of passion, is the soul of interest in the most complicated incident, and every action, however simple, is so far forth itself an incident.

Still difference of degree constitutes a real difference. From the various and even vehement actions and passions represented in a cartoon of Raphael, it is in contrast with one of his Holy Families, in a group of a watching mother and sleeping infant. The term dramatic is not wholly inapplicable to a representation of a battle or a martyrdom, and to subjects including numerous figures in excited action as Hogarth's "Election," or "Marriage à la mode." The border of the class is touched by even landscapes in such an example as the Wilson's "Slaughter of the children of Niobe," and a storm by Nicolas Poussin.

But when the incident in a landscape is so tame as the "Embarkation of Queen Dido" by Claude, the subject can at most be called one of action. This category includes most of the great antique single statues, as the Diana of the Louvre in act to draw an arrow with a distinct intent; or Apollo who watches one which he has that instant discharged. The Moses of Michael Angelo exhibits an action which requires to be explained; there is a deciding motive in the groups of Raphael's Holy Families, different in every case; and in portraits the fact is often as positive, as when we discern by the bend of his cape that Leo X has only just withdrawn the lens from his eye with which he has been examining the illumination which lies before him. There is action in the portrait of Dr. Johnson bending shortsighted over his book, no less than in that of Sterne, which shows how the sudden movement inspired by a humorous thought has disturbed the symmetrical *sit* of the wig to the scandal of the robes of that very peculiar ecclesiastic.

But in portraits generally, sentiment pure and simple predominates spontaneously, because the air of the head — that old but most descriptive expression for the light involuntary poise — not pose — more characteristic than any gesture—is consequent on a prevailing tone of thought, on the momentary wave of feeling which defies detection and interpretation in words, and yet speaks a language which is universal. Sentiment may be considered to be superseded by the equivalent of action, when the portrait appeals to the spectator in a spirit which admits of interpretation, appeals to him with dignity or pertness, or refers us directly to the studio by an obvious consciousness of sitting or standing to be painted, or generally as attentive to something on the hither side of the canvas. The Duchess D'Arenberg by Vandyck, seems to say without reserve or affectation, "I am standing for my portrait, full dressed, dignified, gracious, well content with the world, and the painter and of course with myself; my child standing in front of me is also dressed for the occasion; it is not my fault if his attention wanders, and that he points at something out of the picture."

The appreciation of the proper excellence of a work of true art demands concentration of attention; by this alone can we penetrate to and be penetrated by the sense of the principle of its characteristic unity. We shall not attain to this if we are constantly being urged to look now at one on the right hand of it, and now at one on the left. We shall be in as inapt a state of mind either for reflection or enjoyment, if we are flinching every moment from the bayonet of a critic behind us, and threatened with the direst penalties of denunciative eloquence if we venture a hair's breadth from the lines of a judgment irrevocably fixed. Great are the distractions of a crowd of works in themselves; under this influence too many become content with a cursory glance and away: "Ah, yes, an effect of green," or "Ah, yes, a composition on the principle of the pyramid;" but upon these art and genius are thrown away.

The spirit of a work of art will of course not be evoked by simply staring at it; we must peruse, must converse with it. In subjects of simple as of complex action, we must put them to question as to what is going on, what is the movement about; and we must be familiar with a work of less definite sentiment, till light breaks upon us by sympathy. Some works would grow upon us continually if we could live with them, have them at home comparatively isolated, available not only for most favorable lights, but for our happiest moments of sensitiveness. As this may not be, it behooves us to learn the art of visiting galleries of art and large collections; of this a primary maxim is not to fritter attention, but concentrate it on what is best; in this way it is possible to learn a work of art even as we learn a poem, to carry it away in the mind with such perfectness that we contemplate it even in absence, and come to understand and feel it even better than when it was before us; and so whatsoever is a "thing of beauty" fulfils the promise of the poet, and becomes indeed "a joy forever."

W. Watkiss Lloyd.

CODE ADOPTED BY BOSTON MASTER-BUILDERS.

Entrance to Mr W E C Eustis' House, Milton, Mass.
W R Emerson, Architect.

At a special meeting of the members of the Master-Builders' Association of Boston, held yesterday at 164 Devonshire Street, the following code of working principles for the year 1887 was unanimously adopted:

The Master-Builders' Association of Boston, after conference with the real-estate owners and architects of the city upon certain aspects of the labor question, do hereby adopt the following code of working principles in the hope that it will be accepted by all concerned as a rational and conservative method of meeting labor agitation in its relation to the building trades:

CODE OF WORKING PRINCIPLES.

Article 1. Change in method of payment for labor performed,

beginning at a date not later than the first day of April, 1887, we will pay for all work performed by journeymen or laborers in our various trades, at a certain price per hour. This price per hour shall be a matter of agreement between the individual workman and the individual employer. This change is not intended to apply to work known as "piece work," or work "by the year."

Art. 2. Hours of labor. — In order to rationally test the question of whether ten hours per day is too long for men to labor, and whether a less number of hours can be accepted as the measure of a day's labor without seriously retarding business enterprises, we will begin on the first day of April, 1887, to work nine hours in each working day, beginning at 7 o'clock, A. M., and ending at 5 o'clock, P. M., with the usual hour at noon for dinner, under payment by the hour as set forth in Article No. 1. All work done before 7 o'clock, A. M., and after 5 o'clock, P. M., to be paid for as overtime at such price as may be agreed upon by the workmen and employers. We will continue on this plan during the year 1887. If it is demonstrated that this change can be made without detriment to the interests of the workmen, or the owners, then the contractors will be satisfied, and if further reductions seem desirable they can be considered at the close of the year when this experiment shall have had a fair trial. If, however, there should be displayed a desire to disturb this trial by bringing on any general strike during the year 1887, then we shall feel at liberty to return at once to the old standard of ten hours.

Art. 3. Protecting clause in contracts, etc. — For the greater security of the contractor, we will demand the insertion of a clause in every building contract relieving the contractor from any forfeiture or demurrage on account of delays caused by strikes. This demand, we are assured by real-estate owners and architects, will be cheerfully granted. In case of a general strike, those men who wish to work, and will work, will be kept employed as long as there is anything to be done, and will be protected in their employment, provided they do not aid and assist the strikers by contributing to their funds; but men who engage in the said strike will not be re-employed until the said strike is completely over, or until they, as individuals, are willing to go to work on the same terms as above stated. In event of a strike, of any one special branch throughout the city, the men who will continue at work in that special branch will be kept employed the same as in a general strike, and all other branches of building will be continued with such men as will not contribute to support the strike. When a point shall be reached upon any building or buildings where further progress is blocked because of the said strike in a special branch, then the contractors in that special branch shall not be pushed or forced by their co-contractors to complete their work, but the said buildings shall be allowed to remain incomplete till a reasonable and satisfactory settlement be reached.

Art. 4. Improper interference with business. — Certain workmen have of late very improperly interfered with the carrying on of work by striking or threatening to strike for the most trivial causes, as follows:

Because certain other workmen were employed.
Because certain workmen were not employed.
Because certain workmen were discharged.
Because certain stock was used or was not used.
Because more than a certain number of apprentices were taken on, and for other equally untenable reasons.

They have also intimidated certain fellow-workmen by threatening that they would prevent their getting employment by refusing to work with them unless they joined certain societies. Such practices we condemn as most unfair and intolerable, and we agree that in case any workmen interrupt and embarrass our operations by such procedure, we will promptly discharge them and notify our fellow-members of the discharge. We also agree that all conspirators shall be prosecuted to the extent of the law.

Art. 5. Arbitration. — It shall be, as it always has been, the recognized right of the group of workmen in the employment of any individual contractor in the building trades to demand and receive from their employer a hearing upon any grievances that may arise, or any changes that may be desired; and at this hearing they can elect to be heard through a spokesman chosen from their number, or by their individual voices; but no person outside of the employment of the said contractor will be allowed to represent them. If amicable ground of settlement is not reached through such hearing, then the grievances shall be left to arbitration — should the terms of such arbitration be mutually agreed upon by the employer and his workmen — in the same manner that other business disputes and complications may be settled.

AGREEMENT.

We, the undersigned, in our individual capacities as contractors in the various branches of constructive work used in the erection of buildings, and as members of the Master-Builders' Association of Boston, hereby mutually agree that we will aid, support and assist each other in maintaining the same stand against improper dictation, as that taken and successfully held by us during the strike of May and June, 1886.

We pledge, in addition, that we will aid, support and assist each other in carrying out the letter and spirit of the propositions above described as our code of working principles for the year 1887.

We further agree that, should we differ from the opinion of the majority of our fellow-members, we will not in any way embarrass their purpose, but, recognizing the fact that uniformity of action is necessary for the proper trial of a scheme like this now proposed, we will faithfully carry out and support the plan agreed upon by the majority during the year 1887, and agree that any member deviating from the action decided upon by the majority will be considered amenable under Section 3 of Article 8 of our by-laws.

In testimony of our assent to the agreement and propositions before mentioned, we hereunto affix our signatures, and agree to faithfully adhere to the principles set forth.

We invite all contractors in the building trades whether located in this city or in any of the cities of New England, to join with us in this attempt to make fair trial of a scheme calculated, we trust, to set at rest labor agitation in our trades, and maintain unimpaired that necessary control and authority without which no enterprise can succeed. We invite all such contractors to call at our rooms and append their signatures to this code of working principles.

A true copy.

Attest: William H. Sayward, *Secretary M. B. A.*

THE CATHEDRAL OF SIENA.

Mr. W. D. Howells, in one of his recent publications, has classed this exquisite building along with such objects as the Pyramids at Egypt, St. Mark's at Venice, the sweep of the Arno at Pisa, and the Falls of Niagara, characterizing them as things to be seen but not described. It may seem rash to venture upon a task forbidden by so high an authority, especially in matters Italian, says a correspondent of the *Glasgow Herald*, but for the benefit of many who have never seen Siena, and with the object of inducing visitors to Italy to include that most interesting old town in their programme, this article may not be altogether amiss. For it is to be feared that comparatively few out of the great stream of tourists find their way there, especially since the opening of the railway from Terontola to Chiusi, which is the route now taken by the express trains between Florence and Rome. Moreover, the attractions of other cities are so numerous and so powerful that naturally those whose time is limited pass over all save the five or six chief towns of the Peninsula. Siena, however, has a charm all its own, and a visit to it, however short, amply repays the time so spent. Its situation among the hills, at an altitude of over thirteen hundred feet from sea-level, gives it an atmosphere healthy and clear, and a temperature which in warm weather may be called cool when compared with the stifling airlessness of Rome, or the broiling heat of Florence.

The buildings of the town are disposed somewhat in the form of the three-legged emblem of the Isle of Man, a configuration due to the meeting of three spurs of hills upon which the place is built. The streets are all of them winding and narrow, while some of them are so steep as to be partly formed of steps, upon which vehicles without wheels are slowly dragged by oxen. Some of these narrow passages are built over in a way which, together with their steepness, recalls the closes of the old town of Edinburgh, only that they are much cleaner than those purlieus of the High Street of the Scottish capital. The principal street is the Via Cavour, which is approached from the railway station by the Via Garibaldi, and leads to the Piazza Vittorio Emanuele, a combination of honored names to be met with in every large town of "Italia Redenta." This Piazza, formerly called the Piazza del Campo, and mentioned by Dante in the eleventh canto of the "*Purgatorio*," is the centre of what life and stir are to be found in the city. It contains the Palazzo Pubblico, a large brick pile of the thirteenth century, with a tall and graceful tower.

While the chief activity of Siena is found in the Palazzo Vittorio Emanuele, its beauty and repose centre in the beautiful church in the Piazza del Duomo, on the highest part of the city. Victor Hugo has described Nôtre Dame at Paris as "*une vaste symphonie en pierre*," and as there are unfinished symphonies in music, notably that of Schubert, so there may also be unfinished symphonies in architecture, for the intention of the people of Siena was to erect an enormous cathedral, of which the present building would only have formed the transept, had not the evils of war and pestilence so severely crippled the resources of the republic that the ambitious plan had to be abandoned. The structure as it exists is thus a monument of what the piety of the Sienese enabled them to achieve, and of what their misfortunes prevented them from accomplishing. It is not of the colossal dimensions of many other celebrated cathedrals, being not more than two hundred and ninety feet in length and seventy-eight feet in width; but it possesses the usual component parts of a cathedral, viz., nave with aisles, choir, and transepts so proportioned as to produce a harmonious whole. The style of the work is Gothic, and the

material used is marble, while its construction occupied about a century and a half, being completed in the year 1380. The side walls are comparatively plain, being built of white marble, with occasional bands of black marble, and they are pierced by the usual pointed windows, plain in the ground story and traceried in the clerestory, while statues are disposed along the top of the walls. The campanile, of alternate stripes of black and white, is placed beside the north transept, and rises to a height of six stories above the main building, terminating in five pinnacles. The façade is a singularly rich piece of work in white marble, relieved by panellings of red and black. It is a mass of beautiful sculptures of angels, prophets, animals, and other devices — a perfect romance in marble. The designer was Giovanni Pisano, and it is more than probable that this distinguished artist was the superintendent if not the actual sculptor of some part of its lovely carvings.

The doorways of beautiful clustered pillars give access to the interior of the building, where the arrangement of alternate bands of black and white marble is a very striking feature. The elaborately-carved arches of the nave are borne by handsome pillars, from the lower parts of which there spring with great freedom and boldness consoles, upon which are placed statues representing the founders of the various orders in the Catholic Church, while the cornice above the arches consists of long rows of busts of Popes in terra-cotta. The intersection of the nave and transepts is covered by a dome, which by some caprice of the architect takes the form of an irregular hexagon. The aisles and transepts are divided into numerous chapels, for the most part gorgeously decorated, in the sumptuous Roman style, with lapis lazuli and variegated marbles, and still further enriched with many treasures in sculpture, by such mighty artists as Michael Angelo, Donatallo, Nicolo Pisano, Giovanni Pisano, and Jacopo della Quercia. A soft yet bright light pervades the whole and blends into pleasing and satisfying harmony the boldness of the nave and the more exquisite portions of the building.

A unique feature of this beautiful sanctuary is the engraving upon the pavement, which is quite covered with *graffiti* representations of scenes and figures, chiefly from Old Testament history. These are protected by coverings of boards and floorcloth; many of the figures are simply outlined and filled in with black, while others are filled with materials of various colors, giving them more a pictorial than a sculptured effect. Under the dome are preserved the two flagstaffs which carried the ensigns of Siena on the *carroccio* or standard wagon of the period, in the great victory gained by the Ghibellines over the Guelphs in the year 1260, at Montaperto, a few miles distant from the city. Similarly are preserved in the Campo Santo of Pisa the great iron chains which closed the passage of the Arno during a war with Florence; and in like manner there is preserved, on the field of Bannockburn, the "Borestone," upon which King Robert Bruce is said to have planted the lion rampant on the day of Scotland's great national victory.

About the middle of the fourteenth century misfortunes overtook the vigorous little republic "on Tuscan hills," for a time the rival of Pisa and Florence, but the piety, the patriotism, and the love of art which then distinguished its citizens are commemorated to succeeding ages by the exquisite temple which sits upon the brow of their city like a crown of glory, a crown of many gems.

THE FOUNDATIONS OF VENICE.

THROUGH the kindness of Signor Boni, one of the architects of the Ducal Palace, I have been examining the data gathered by him and his colleagues, says a correspondent of the London *Times*, as to the methods of the builders of Venice in preparing the foundations of their structures, data which furnish information of interest to those who love the city of the lagoons.

Signor Boni's examination of the cylinders drawn up from the artesian borings shows that the subsoil of Venice for at least 200 metres is an alternation of clay, sea-sand, mud, and carbonaceous matter, showing that for ages before Venice existed its site was exposed at long intervals to the action of rivers, to the sun, and then to the sea, no fewer than ten different strata showing the evidences of as many periods of exposure to the sun, having been covered by vegetation, and then re-immersed, the sea coming and receding, followed by the floods from the mountains again. The present period of exposure has been a much longer one than has generally been imagined, for Cavalier Battaglini, the zealous custodian of the museum of Sorallo, has found in his excavations on the islands vases of early Italic type, with others Etruscan, and many of the early Imperial epoch, so that when the people of Altinum fled before Attila they took refuge in well-known and inhabitable localities, though sea-built isles.

When, therefore, it was intended to place the foundations of a mass of masonry like the palaces of the twelfth to fifteenth centuries, or the huge piles of the campaniles, the practice was to excavate the unstable soil and *débris* of depositions, the constructions and demolitions of centuries previous, until solid clay was reached, rock being out of question at any depth. The first layer of clay being reached, piles were, when great stability was needed, driven in and down to and through the next stratum of firmer and more resisting clay into the stratum of sand beneath. These piles, first driven in a hollow square, were then driven within it until the square was filled as close as piles could be driven, and the interstices with fragments of stone rammed in. On this a raft of oak planks several inches thick was laid, crossing in double layer, and on this were deposited masses of squared stone up to the wall bases. This wood, laid in the fourteenth century, is still found in perfect preservation. This, at least, was the process followed in the construction of the campanile of St. Mark's, the foundations of which were recently laid bare by Signor Boni, and the surprising fact was learned that this foundation, bearing the greatest weight per superficial inch of any substructure in the world, only widens about two metres on fifteen square at the pavement from the base of the campanile to the *palafitta*, as the mass of piles is called, a depth of five metres. And this is the most solid foundation yet explored. That of the Ducal Palace lacks the *palafitta*, the stones of the substructure, 2.88 metres deep, being laid directly on the first stratum of clay, and this in the structures of the various periods; that of St. Marks has a *palafitta* only 2.10 metres deep. The foundations of the church of the eleventh century show better work and better materials than the later constructions, the marble shell which was added a century later having only a semblance of foundation, even less than was the case with the pavilions of the southwest and northwest angles already described. This *palafitta*, where it exists, does not go down to that deep stratum of clay of great firmness on which the campanile rests, and therefore is more liable to subsequent and unequal subsidence, the stratum of clay on which the *palafitta* rests being unequal in thickness as well as compactness.

Now, as we do not know how far the general subsidence or elevation of the surface of the island has gone since the date of these constructions, it is impossible to determine exactly what may be the subsidence of the structures; but we have in St. Mark's an inequality between portions that must have been on a level once of nearly or quite a quarter of a metre in the width of a portico. The campanile must have subsided as a whole, for the weight of the mass, calculated at nearly 20,000 tons, could not fail to make an impression on the stratum of clay already entirely traversed by the *palafitta*, the points of which enter into the sand beneath it, and it has certainly not failed to produce the partial subsidence which is found more or less in all Venetian buildings, the north side of the campanile having reached the perpendicular from the gradual greater subsidence of the foundation on that side, and the old pavement of the square is found at 72 centimetres below the present. A similar difference is found in the Ducal Palace, where were in the original construction three steps leading from the piazza up to the floor of the arcade now on the same level. But this difference is difficult to apportion, as we have no data from which to prove the original elevation above the general surface of the island. What is clear is that the site of the Ducal Palace was much more trustworthy and equal than that of St. Mark's, as the permeability of the latter is still very great, the rise and fall of the tide being visible in that portion of the first church which lies under the great dome, as may be seen through the little window in the enclosed portion of it. The Ducal Palace, if sinking, is sinking solidly and equally, and though by its construction necessitating ties and braces of iron, does not show any serious cracks such as appear in St. Mark's, which, considering the slight difference in the substructures of the two buildings, can only be due to the fact that the palace was built on a natural ridge, and the church on a more or less artificially formed soil.

This partial subsidence is the cause of the precarious state of St. Mark's, and, were the means forthcoming, would justify a far more radical statical restoration than anything hitherto attempted. This subsidence, besides the fracturing of the walls and general injury caused to mosaics and marbles of the facing is, as I before said, destroying the pavement, and the committee of the English Society for the Preservation of Ancient Monuments, in the protest to which I have alluded, adduces the fantastic theory that the pavement was originally made undulating to show that St. Mark ruled the waves. It ought to suffice to study with even slight care the pavement itself to recognize the absurdity of this idea. In the first place, the position of the piers beneath is tolerably well indicated by the thrusting upward of the pavement, and then it will appear clearly, if one will examine the splendid slabs of Greek marble which cover a great part of the pavement of the nave, of which those under the nave, about twelve feet by five feet, are all sawn from one block, and were clearly intended to preserve their plane surface, but are now cracked, or in some cases badly broken over the resisting points of the substructure, the number of the fragments varying from half-a-dozen to three dozen.

all, however, being broken. Of this the just issued annual report for this year says: "In the interior of the church one of the most urgent works is the reconstruction of that large portion of the pavement which lies under the central cupola, and this on account of the unequal subsidence (*avvalamento*, valleying) which seems to be increasing, and which causes numerous and dangerous falls." This portion of the church is that before the pulpit of the Patriarch, and the present state of it is a positive danger to his audience, which certainly was not the intention of builders of St. Mark's. I am glad to see that the report recognizes the necessity in the future of the complete restoration of the pavement, some of the most interesting designs in which are already destroyed beyond recovery by wear, though for the present these plans are simply recommendations for consideration of the Government of Rome, which, on the recommendation of the Commission for the Preservation of Ancient Monuments, decides what part of the suggested works shall be carried out. And since I am on this subject I will, for the information of your readers as to the effects of the subsidence spoken of, quote a single sentence from Dr. Saccardo's report of the restoration of the ancient chapel of St. Isidoro: "the roof showed, still open, the crevices produced by ancient movements of who knows how many centuries, movements so great and grave that the head of one of the figures in the mosaic was removed a good palm from the body."

Of course much of this insufficiency of the foundations of St. Mark's is due to the facts that the church was not in its beginnings calculated for the scale which it has reached, and that work of the eighth century, which was for its then uses sufficient, became by the later additions buried beyond reach and reinforcement of the architects of the twelfth century, during the interval between which periods it was in progress. The basilica had four centuries of construction, four of embellishment — it is approaching its fourth of nursing and more or less intelligent restoration — in all a history unique in the existence of architecture.

COMMUNICATIONS

THE MIXING-CHAMBER FOR HOT-AIR HEATING.

New York, September 28, 1886.

To the Editors of the American Architect: —

Dear Sirs, — In "An Editor's Trip Abroad," of your journal of the 25th instant, page 145, the following sentence occurs: "As in Trinity Church, Boston, and perhaps in other American buildings, M. Nénot had provided for converting the whole of the basement beneath his principal room into a warm-air chamber, with openings through the floor at suitable points." Permit me to say that this system of heating was applied by me in the Fifth Avenue Presbyterian Church, in this city, without knowing that it had ever been done, and several years before Trinity Church of Boston was built. The Building Committee of that church, or some of its members, visited the Fifth Avenue Presbyterian Church, apparently before any scheme of heating was adopted, as shortly after this visit I received a letter from the Chairman asking me to give him a full explanation of the mode of heating at the Fifth Avenue Presbyterian Church — generally known as Dr. Hall's Church.

Respectfully, Carl Pfeiffer.

INTERMITTENT *VS.* PERSISTENT DISCHARGE FOR SUBSURFACE IRRIGATION.

New York, October 4, 1886.

To the Editors of the American Architect: —

Dear Sirs, — Referring to a communication in your issue of September 18, we desire to say that in our experience we have found that an intermittent discharge is *not* absolutely necessary in a system of sub-soil irrigation. The former chief engineer of this company, Mr. W. Paul Gerhard, executed a plan of his own devising at Montclair, N. J., where the discharge was a simple overflow into absorption tiles, which has worked satisfactorily for more than two years. The ground is a stiff clay, and without slope. The same plan has been repeatedly used by us for single dwellings with uniform results. The public want as little machinery as possible with their sanitary arrangements. Very truly yours, C. W. Durham, C. E.

[To this we can only say that we are as much surprised that this arrangement has not been clogged with grease and sludge, as that Mr. Gerhard should recommend it. We have known the same thing done, and have used it several times ourselves, but the fouling, although slow, is so complete without the intermittent discharge that we believe the more expensive arrangement to be cheaper and better in the end. — Eds. American Architect.]

GERMAN MIDDLE-CLASS HOUSES.

New York, October 2, 1886.

To the Editors of the American Architect: —

Dear Sirs, — While sojourning recently in one of the German capitals, my attention was particularly called to the easy and simple manner in which the Germans live and keep house, as compared with that of our own people, who dwell in rented houses in New York and other of the principal American cities, the difference arising particularly, I am persuaded, from the construction and arrangement of the dwellings themselves. I refer now to houses of that class of society who are neither rich nor poor—the so-called middle class—who usually, here in New York, rent houses at prices ranging from eight hundred dollars to fifteen hundred dollars per annum, but who seldom live in flats or own houses of their own. The reason that this class of people do not more generally live in flats or apartment-houses is simply because few such buildings, adapted to their necessities and means, have yet been erected. But there is every reason to believe that many of their number, like some of the more wealthy, who can afford to pay three or four thousand dollars a year, would be very willing to exchange their three-story, high stoop, and often ill-constructed dwellings for apartments of an equal number of rooms, having the attributes of perfect light, ventilation, privacy, etc., at the same rent as they now pay, could such be had in New York. I believe that such apartment-houses may be built, rented at eight hundred dollars to fifteen hundred dollars per suite, and allow the owner a handsome interest on his investment. Let us compare, briefly, the dwellings of this class in New York with those of the same class in the larger cities of Germany. Everyone knows what the ordinary twenty-foot, three-story house is here, with its high stoop, brick or veneered brown-stone front, uninviting basement dining-room, with kitchen back, narrow hall, and parlors in first story, with a repetition of the same hall and stairway in the second and third stories, and too often with defective plumbing and poisonous coal gas. The work required to keep such houses in order, not to mention the usual disadvantages of poor light and ventilation in the halls, is almost double that required by the German dwellings. There the houses are built free on all sides, are usually four stories in height, accommodating one family on each floor. The staircase is broad, has windows at each landing, and every apartment has its individual entrance and bell. The buildings are ordinarily about square, the main rooms grouped about a central hall, the kitchen and servants' bed-room being separated by an entry. All rooms are well lighted, have perfect ventilation, and, being on one floor, half the labor of housekeeping is avoided. I think it scarcely requires argument, that such flats in New York, with the addition of the best modern plumbing and steam-heating, which have not yet been introduced into the houses in Germany, would find ready occupants as fast as they could be erected. But until capitalists are assured of a fair return for the money invested, such buildings will not be built, as many even of those apartment-houses, where the suites rent from three to four thousand dollars have not been financial successes. However, I think to those having money to invest, apartment-houses for just this middle class of people is a subject well worthy of consideration: they desire neither the luxury of a palace nor the shabbiness of a French flat, but as much room, and more light, air, ventilation and comfort than can be obtained in the ordinary twenty-foot dwellings above referred to.

Take, for instance, a plot of ground two hundred feet square, that is, sixteen city lots, which, at ten thousand dollars per lot, makes a total of one hundred and sixty thousand dollars for the entire plot. This would allow of the houses being built in a desirable locality. Erect eight detached buildings, averaging forty by sixty-five feet, and five stories high, so arranged that there is a space twelve feet wide between each two, a portion of which would be utilized for the stairways and elevators, which would be constructed wholly outside of the main walls of the buildings. Such structures, supplied with steam-heat, the best of plumbing, neatly finished, and each and every room having direct access to the air, and, consequently, proper ventilation, would cost not to exceed sixty thousand dollars each, making a total for the eight of four hundred and eighty thousand dollars, and a grand total for the whole investment of six hundred and forty thousand dollars. The entire structure could be planned to accommodate sixty families, at an average rental of twelve hundred dollars, making a total of seventy-two thousand dollars as the gross receipts for all the apartments. Now, deduct twenty-five thousand dollars per annum for taxes, insurance, gas, coal, and wages of employés, etc., and we have forty-seven thousand dollars as the interest on an investment of six hundred and forty thousand dollars, or a little more than seven per cent. The benefits derived by the occupants of such apartments would be, chiefly, perfect safety from fire, each floor being intact, as staircases and elevator-wells are entirely outside of the buildings (there are no light shafts); the utmost privacy, as each has its own entrance and vestibule; perfect light and ventilation, and, on account of the arrangement of the rooms, the least possible care to the housekeeper, besides all of which, such as steam-heating, plumbing, and elevator service as are found in the most costly apartment-houses in the city.

J. R. H.

NOTES AND CLIPPINGS

Shingles One Hundred and Fifteen Years Old. — A Danielsonville correspondent of the *Sun* writes as follows about the shingles removed a few days ago from the steeple of the Unitarian church at Brooklyn: "One of the first pastors of the church nailed them with big-headed wrought-iron nails to the steeple in 1771, and under them General Israel Putnam often has sat and listened to the discourses — rare in these days — giving liberal interpretations of the Scriptures. It is stated also that the shingles were 'rived' by men who afterward fought with Old Put at Bunker Hill. The shingles are remarkedly well preserved. Four of them are displayed in the street windows of the *News* office, in this village, and above them is a placard with this reading: 'These shingles were in use on the Unitarian church in Brooklyn 115 years. Just look at the nails.' The nails are fine specimens of old

fashioned, pains-taking workmanship. They are smooth, straight and round, with large, thin, perfect heads, and are as clean and bright as at the time they were driven into the steeple. They would be considered to-day too valuable to use in any except the most elaborate and costly work. The shingles, which are of red cedar, are not at all decayed."

The Iron Spire of St. Stephen's, Vienna.— The tower of the ancient church of St. Stephen's, Vienna, which is supposed to have been founded in 1144, was greatly injured by an earthquake in 1549, and it was necessary to restore it. In course of time it deviated out of the perpendicular to a considerable extent. An iron bar was carried through it as an axis for the support of the spire, which, having a considerable tendency to vibrate, might be considered as an element of destruction rather than of strength. Consequently the thin wall of the lower portion of the spire was reduced almost to a ruin, and at length was in such a dangerous condition as to require rebuilding. The removal of the old spire was commenced in August, 1839, and in the following spring all the condemned parts had been removed. The mode of construction adopted in the restoration was novel and ingenious, the slight masonry of the spire being supported by means of a framing of vertical iron ribs, fastened at their lower extremities to a cast-iron plate or base, and united to each other at intervals by horizontal rings of rolled iron. These rings are made to project from the inner surface, so as to admit of a person ascending, with the assistance of ladders, to the top of the spire. All the wrought and rolled iron employed in the construction of this iron skeleton, the weight of which was only 123 hundredweight, was manufactured in the Government works at Neuberg, in Styria. The cast-iron plates or rings were furnished from the Government iron-works at Mariezell. In the autumn of 1842, when the whole of the masonry of the spire had been completed, the upper portion, consisting entirely of ironwork, was fixed. This also was attached to a strong cast-iron circular plate, similar in construction to that below. This portion of the framing, with the other ironwork employed in the spire, weighed about 80 hundredweight, so that the entire weight of iron was about 203 hundredweight. The new portion or the spire was connected to the old by means of an arrangement of iron anchor fastenings. The portion of the spire restored (viz., from the gallery of the tower to the top of the cross), is about 182 feet high, the cost having been about 130,000 gulden (£13,000), of which sum 15,500 gulden were expended in taking down the old spire and in the construction of the necessary scaffolding.—*Iron.*

What is "Tenantable Repair"?— A much-vexed question between landlord and tenant had a little light thrown upon it on July 29 by the Court of Appeals in the case of Crawford and others *vs.* Newton. By an agreement for a lease, a tenant contracted to take a house for a term of five years, and to "keep the inside of the buildings in tenantable repair, and so deliver them up at the end of the term." The tenancy was continued beyond the five years, as a tenancy from year to year on the terms contained in the agreement until 1884, when the tenant gave up the house. The plaintiffs sued for damages for breach of the provision to deliver up the buildings in tenantable repair. It appeared that the tenant had not painted or papered the house during the tenancy, and certain parts of the woodwork were worn away or decayed, and holes were left in the walls where the tenant's fixtures had been removed. Mr. Justice Cave, before whom the case was tried, held that the tenant was not bound to paper or paint or to put the house into decorative repair, but allowed the plaintiffs £20 for structural repairs, such as replacing the decayed woodwork and repairing the holes in the wall, and also for an extra coat of paint rendered necessary in one portion of the house where the woodwork had decayed. From this judgment the plaintiffs appealed, and contended that under the words "tenantable repair" the tenant was bound to deliver up the house in such a reasonable state of repair both as to paper and paint and otherwise that a new tenant could take it. The Court dismissed the appeal. The Master of the Rolls said that the case was fought by the plaintiffs at the trial on the ground that they were entitled to have the house papered and painted so that it should be in the same condition as when the tenant took it, and that the damages ought to be assessed on that footing. The learned judge came to the conclusion that the plaintiffs were not entitled to that extent. He decided that where any waste had been committed they would be entitled to compensation for that. As to the painting, he said that some paint might be necessary to prevent the woodwork from going to decay, and he held the tenant bound to paint to that extent; but beyond that he held that the tenant was not bound to paint, as that would be decorative painting, and "repair" had nothing to say to decoration. The question was whether the learned judge was bound to go farther and hold that the tenant ought to have painted and papered where painting and papering had been done before. It was unnecessary to determine the exact meaning of the provision as to "tenantable repair," though perhaps it would be very desirable to do so. But, at any rate, one might say that it only referred to the question of repair and not to the question of ornamentation. It was sufficient to decide this case to say that decorative painting, which was not wanted for the preservation of the building but for ornamentation, could not come within the terms of this provision or covenant. The same remark applied to papering, which of necessity was mere ornamentation. So without saying what "tenantable repair" was, it was sufficient to say that papering and painting beyond what was necessary to keep the house in repair did not come within its terms. The judgment was, therefore, right.—*Sanitary Record.*

TRADE SURVEYS

The past few days have developed a number of interesting tendencies and factors, by which the course of trade for the coming six months can be more clearly traced. In the first place, there has been a marked advance in the prices of several products. In the next place, there has been a rush of orders and inquiries for material. Then, manufacturers have, in many cases, refused orders, assigning, in some instances, the reason that they were unwilling to book large orders at this time, because of the uncertainty as to the price of material sixty or ninety days hence. In addition to this, manufacturers, builders and contractors have been able to see a little more clearly into the future. They find that the requirements in all directions will be very heavy; in fact, extraordinarily heavy. This enlargement of consumptive requirements has been brought about partly by the necessity under which capital finds itself for securing employment, wherever employment can be found. It is travelling into the far West and far South, and confidential agents of large financial concerns are now carefully investigating the possibilities of schemes of an industrial character, in remote localities. There are other influences at work, to account for this enlargement of consumption, the most potent of which is, the increased-earning capacity of the masses, who are, and for months have been, well employed and well paid. Elements of disorder have been removed, or corrected, by the operation of natural laws, in an unobserved way, and the entire country finds itself, in the autumn of 1886, in a toned-up condition, with its energies freshened, and its comprehensions of business possibilities greatly enlarged. We are not deceiving ourselves in saying and believing that the coming six months, and very probably the coming twelve months, will be periods of unusual industrial and commercial activity. A year ago, the possibility of the return of such a season as this was seriously doubted. The enormous machinery capacity, railroad capacity and money capacity, was thought to be then far beyond the limits of probable requirements. But here we are already, leaping ahead of facilities and of supplies. All of the industries are crowded. There is scarcely any idle labor. New industries are springing up in the West and South. The iron trade is in a better condition than it has ever been; not in one or two branches, but in every one. Crude iron has advanced fifty cents per ton for the special makes; refined and medium iron, besides tank-plate and steel-iron, are all very strong and active, and both manufacturers and buyers are expecting a further advance by November 1. Mills are sold from one to three months ahead, and buyers of small lots of material find it difficult to secure supplies within sixty or ninety days. The bridge-builders are very busy on winter and spring orders, and during the past week specifications were submitted for material calling for eight or nine thousand tons, at least. The rail-mills are scarcely able to accommodate December or January buyers. Old material of all kinds is scarce and active, and prices have advanced 50 cents to $1 per ton. In the lumber trade there is a healthy scarcity of building material, but not such as is likely to create a general advance. Retail dealers are carrying light stocks. Wholesale dealers have taken the alarm, and are purchasing as quietly as possible, without alarming the trade. Eastern supplies are heavy, but in view of the enormous consumption, they are not likely to depress prices.

In the coal trade a general advance has just taken place in anthracite, and an improvement is thought probable in the bituminous centres of the Western States. The Governor of Pennsylvania has seen fit to direct that steps be taken to ascertain whether the anthracite coal combination is violating the organic law of the State. The anthracite companies expect to advance prices still further during the winter, in both Eastern and Western markets. In Chicago the Western Combination met last week and resolved to take out of coal all there was in it. In other industries, such as the textile industry, there is greater activity than ever before known in its history. Wool is very strong, and still advancing. Cotton is a trifle higher. Textile products of all kinds are bringing asking-prices, and manufacturers are unable to more than keep pace with the urgent demands of jobbers and buyers.

In building matters there is necessity of noticing some little falling off in several cities and localities. Throughout New England, especially in the towns and villages, a fair degree of building activity is generally reported. Architects and persons interested in real-estate operations, think it probable that small house-building will assume much larger proportions next year than this year, mainly for operatives' requirements, and some architects are now at work on plans for small houses of an attractive appearance and comfortable interior, which can be built at small cost. There is room for enterprise and talent in this direction. The abodes of the operative classes are too generally neglected by architects, and even by builders, and nowhere else than in New England can the needed reform be set in operation. The figures showing real-estate operations in New York indicate a great deal of activity, and a sharp increase over last year. The figures, as given by an industrious contemporary show that, for the first nine months of this year, the conveyances numbered 10,299, representing in round numbers, $186,000,000, against 8,237 conveyances for the same time last year, representing in round numbers, $133,000,000. The corresponding figures for mortgages were, 9,290, and 7,451, and the sums of money $104,000,000 and $76,000,000 respectively. So far this year the buildings erected, and for which permits are taken out, count up $50,000,000 in round figures, against some $36,000,000 for the same time last year.

In Philadelphia the number of permits granted since January 1 foot up 3,117 against 2,958 for the same time last year. The number of operations have been 7,961 against 6,496 for same time last year. The number of two-story houses built, or for which permits have been taken out, are 4,079 against 3,650 for the same time last year, and for three-story houses 1,699 and 1,311 respectively. Going farther West we find a very general improvement in building activity in Pittsburgh, and in a half-dozen active manufacturing centres within a hundred miles. Along the Ohio Valley the reports during the past week have been more encouraging, although there is no very great rush in building. In Chicago there is a perceptible decline in heavy operations, but there is the promise of improvement in small houses, especially along the lines of the several roads leading out of that city. Real estate has been picking up along those lines, and, according to some opinions, there has been an advance in the value of city real estate in many of the larger towns along the trunk lines, between Chicago and New York. There is certainly no evidence of any retrogression. On the other hand, all of the conditions are favorable to an increase in house and shop building. The industries between these two great cities are vigorous, and there is nothing to interfere, so far as is observable, with the continued healthy development of all the industries, great and small. In the farther Northwest the same general conditions exist; but the ups and downs of trade are more quickly and deeply felt, because the newer sections are subjected to numerous unsettling influences, such as good and bad crops. Throughout the Mississippi Valley there seems to be a genuine revival at work, but this depends upon the certainty of good agricultural results. If the Mississippi does not overflow, if there is no repetition of strikes — and there is not likely to be — if cotton advances in price, as it is likely to, and if the crops are favorable, as is very probable, the spirit of improvement will take a fresh start, and a great deal of willing capital will find its way through that rich valley and lend a helping hand to struggling industries as well as to struggling agriculture and transportation interests. The great interior is offering numerous inducements now, and with a continuation of the present healthful tendencies, these opportunities for the investment of money will increase in number and broaden the opportunities for the builder, the architect, the carpenter, mason, bricklayer, painter, and decorator.